Quantum

User's Guide

Quantum vmPRO

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Preface

This manual introduces the Quantum vmPRO and discusses its configuration and operation.

Audience

This manual is written for Quantum vmPRO operators and administrators. It is assumed that this audience has at least a basic understanding regarding the use and function of the following products and applications:

- VMware
- UNIX®
- backup and recovery systems

Document Organization

Following is a brief description of chapter contents.

- Chapter 1, Quantum vmPRO Overview provides an overview of all the functions and features that can be accessed from the vmPRO GUI.
- Chapter 2, Getting Started With Quantum vmPRO provides information about accessing and configuring Quantum vmPRO.
- Chapter 3, Back Up and Store Data With Quantum vmPRO provides information about using the vmPRO tools and features that allow you to back up and store your data.

- Chapter 4, Recover Data With Quantum vmPRO provides information about using the vmPRO tools and features that allow you to recover your data.
- Chapter 5, Using Groups and Folders With Quantum vmPRO provides information about how to create, set up, and manage groups and folders for more efficient and faster backups.
- Chapter 6, Quantum vmPRO Advanced Use provides information about advanced features of Quantum vmPRO.
- Appendix A, Console Commands and vmPRO Procedures provides a list of Quantum vmPRO console commands and usage information.

Notational Conventions

This manual uses the following conventions:

Convention	Example
User input is shown in bold font.	**cd /tmp/VISION/**
Computer output and command line examples are shown in monospace font.	`Sample output`
User input variables are enclosed in angle brackets.	**http://<ip_address>**

For UNIX and Linux commands, the command prompt is implied.	`./setup-linux.bin`
	is the same as
	`# ./setup-linux.bin`

File and directory names, menu commands, button names, and window names are shown in bold font.	**/tmp/VISION/**
Menu names separated by arrows indicate a sequence of menus to be navigated.	**Configuration > Licensing**

The following formats indicate important information:

Note: Note emphasizes important information related to the main topic.

Caution: Caution indicates potential hazards to equipment or data.

WARNING: Warning indicates potential hazards to personal safety.

Related Documents

The following Quantum documents are also available for Quantum vmPRO:

Document No.	Document Title	Document Description
6-67534	*Quantum vmPRO Release Notes*	Compatibility and support information about the latest release of Quantum vmPRO.
6-66527	*Quantum Vision User's Guide*	Describes the Quantum Vision web-based user interface, management, configuration, and operation.
6-67612	*Quantum DXi V-Series User's Guide*	Describes Quantum's DXi V-Series appliances (DXi V1000 and DXi V4000) Web-based user interface, operations, and configuration.

Document No.	Document Title	Document Description
6-67081	*Quantum DXi-Series Command Line Interface (CLI) Guide*	Describes the CLI commands for DXi V-Series Software.

For the most up to date information on Quantum vmPRO, see:

http://www.quantum.com/ServiceandSupport/Index.aspx

Contacts

For information about contacting Quantum, including Quantum office locations, go to:

http://www.quantum.com/aboutus/contactus/index.aspx

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Worldwide End-User Product Warranty

For more information on the Quantum Worldwide End-User Standard Limited Product Warranty:

http://www.quantum.com/serviceandsupport/warrantyinformation/index.aspx

Chapter 1

Quantum vmPRO Overview

This chapter introduces the Quantum vmPRO and describes the Quantum vmPRO's requirements, interface with Quantum Vision, and presents an overview of the vmPRO's Graphical User Interface (GUI).

- Quantum vmPRO
- Quantum vmPRO Requirements
- Quantum vmPRO Capacity License Calculations
- Quantum vmPRO and Quantum Vision
- Quantum vmPRO GUI

Quantum vmPRO

The Quantum vmPRO is a light-weight, agentless backup application that protects data in its native format.

vmPRO is a virtual appliance that consists of a Linux virtual server running vmPRO software; vmPRO is deployed into a compatible customer-provided VMware vSphere ESX or ESXi environment.

At the heart of your vmPRO is SmartMotion™. SmartMotion™ provides the backup services by initiating a scheduled push of specified vmdk files to any specified NAS mount point. The mount point can be resident on plain NAS storage or on a deduplication system such as the Quantum DXi. In addition SmartView™ can present the ESX environment as a

virtual NAS file system (an NFS or CIFS share). This provides a simple integration point for third-party applications.

In the background, progressive optimization, which includes leaving out whitespace, deleting any unused blocks, and organizing the data stream for efficiency, is performed on the vmdk files whenever a read on the virtual file system is initiated.

vmPRO Highlights

The Quantum vmPRO provides the following functions and capabilities:

- Provides native format access to backed up data (CIFS or NFS), as well as provides restores with drag and drop functionality.
- Runs on a self-contained VM appliance with no extra agents or dedicated servers.
- Provides image-level backup and restore capabilities, as well as direct file-level restore capabilities thru SmartView™.
- Auto-discovers VMs for better protection in dynamic environments.
- Recovers archived data without proprietary backup applications from any medium (disk, tape and cloud).
- Uses vStorage API to access all VMs – running or idle – from one location (Compatible with Change-Block Tracking).
- Supports full manageability within a vCenter console.
- Supports vSphere 4.X and vSphere 5.X environments.
- Provides VSS support for Windows Shadow Services.
- Reduces host, network, and storage resources by up to 75% with patented Progressive Optimization.

Quantum vmPRO Requirements

The following are the system requirements for the Quantum vmPRO appliance:

- One or more VMware ESX or ESXi servers, versions 4.0 update 2 or later (Only paid versions of VMware ESX or ESXi servers should be

used. Free versions have various API limitations that prohibit vmPRO from functioning as designed.); or a VMware vCenter server, version 4.0 update 2 or later.

- 12 GB of free disk space.
- At least 1280 MB of free RAM.
- Gigabit NIC port for data movement on the Quantum vmPRO host server.
- Internet Explorer and Firefox with Adobe Flash 9 or Flash 10 plugin.

Notes

The following section presents helpful information that will assist you when setting up and configuring your vmPRO backup solution.

- If you plan to use more than one vmPRO as part of your backup solution, the vmPROs should be set up in a group configuration.
- If multiple VLANS are present, the Quantum vmPRO network should be configured on the VLAN that has access to the ESX or vCenter server(s) to be protected. This VLAN must be accessible by the backup software client that connects to the Quantum vmPRO network.
- In environments with DHCP, the Quantum vmPRO appliance automatically acquires a network address. However, Quantum recommends configuring a static IP address during configuration.
- On Windows Backup Servers, the Quantum vmPRO appliance can join an Active Directory domain, and any authenticated user can be used for CIFS backup. When there is not an Active Directory integration, a local user with the same user context as the Quantum vmPRO admin user (sysadmin/sysadmin) is needed for CIFS backups.
- In environments with numerous ESX or ESXi servers and many virtual machines, multiple Quantum vmPRO appliances may be deployed on more than one ESX or ESXi servers to increase overall performance and throughput.
- Do not clone a vmPRO. Cloned appliances are not supported.

Quantum vmPRO Capacity License Calculations

The vmPRO appliance uses a Capacity License that is enforced based upon the total allocated capacity of all virtual machines exported (see Selecting VMs for Export on page 90) to a vmPRO instance (a single vmPRO appliance). If you exceed the capacity license, you will receive error messages, but your backups will still function and you can still restore data.

Note: Customers who purchase a Quantum vmPRO 4000 product receive a target-based license for their vmPRO environment. This license has no capacity limit or calculation, but is limited to using just a single share as a target in backup policies.

VMware provides the vmPRO appliance the information it needs to determine the maximum allocated size of each virtual machine (VM) that has been selected for export. Even though the VM may be using only a percent of its maximum capacity, the vmPRO uses the maximum capacity value for its calculations.

For example: a VM has a maximum allocation of 250 GB but is actually using only 115 GB. The vmPRO uses 250 GB for its capacity license calculations.

Since an exported VM's maximum allocated size counts toward your capacity license, we advise that you do not export a VM until you want to include it in your backup.

It is a good practice to keep a record of the disk space allocated to each VM when you create them in VMware. This record gives you a good estimation of the capacity that you need. vmPRO 3.1 and later have a **Size** column that can be displayed on the **VMs** tab. The **Size** column displays the size of each VM. Use this information to determine how much capacity you will need (see Figure 4).

You can also use your operating system to determine your capacity requirements. When you have selected (for export) all the VMs you plan to backup, do the following:

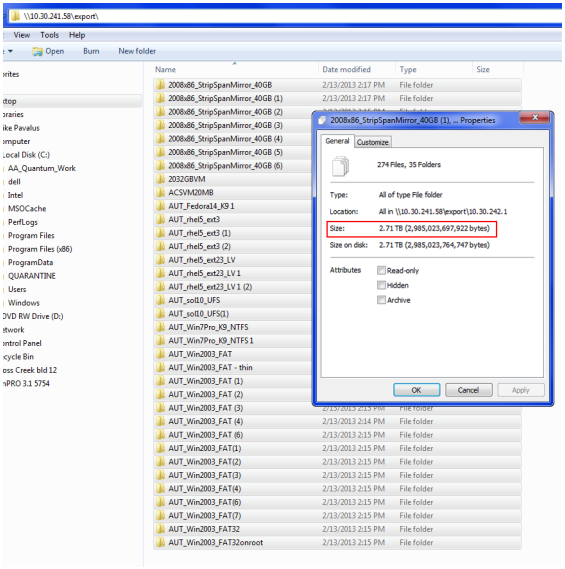
1. Using Windows Explorer (assuming Windows), browse to the **\\<vmpro-host-ipaddress>\export** share.
2. Select all the VMs you are backing up.

3 Right-click on the selected VMs, and select **Properties**.

4 The **Properties** dialog box displays a total **Size** calculation for the selected VMs. That number is the size of the capacity license that you need (see Figure 1). In this case, you can see that you would need approximately 2.8 TB of disk space.

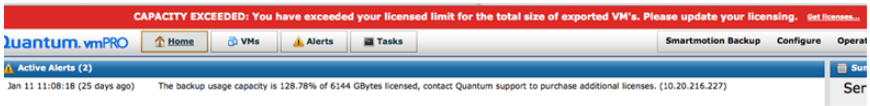
Note: The target DXi, the actual disk space used by the VM, and the use of thin provisioning have no impact on the size calculation.

Figure 1 Total Size of VMs



Should you exceed your capacity, the vmPRO GUI will display a warning banner (see Figure 2). The backup still continues; however, you will continue to receive error messages. At this point, you should contact your Quantum sales representative to purchase a capacity license, and then add the capacity license to your vmPRO (see Licenses on page 33).

Figure 2 Capacity Exceeded Warning


CAPACITY EXCEEDED: You have exceeded your licensed limit for the total size of exported VM's. Please update your licensing. Get licenses...
Quantum. vmPRO
Home
VMs
Alerts
Tasks
Smartmotion Backup
Configure
Active Alerts (2)
Jan 11 11:08:18 (25 days ago)
The backup usage capacity is 128.78% of 6144 GBytes licensed, contact Quantum support to purchase additional licenses. (10.20.216.227)

If you have configured your vmPRO to support **Upload a report to Quantum support site every day** (see Emails, Reports, Alerts, and

Autosupport on page 62), Quantum can actually tell you what capacity you are currently using.

Quantum vmPRO and Quantum Vision

Quantum Vision provides various interactive status, history, and device reports using at-a-glance status reports and automatically generated alerts to provide an overview of all systems. Quantum Vision also provides trend analysis and real-time data capture that help users make decisions concerning capacity planning, troubleshooting, replication operations, and performance tuning. Vision will accesses the vmPRO API to gather alert and backup information to fulfill its status and reporting requirements.

Quantum vmPRO GUI

The following is an overview of the functions and options you can access from the Quantum vmPRO GUI. The overview contains the following sections:

- Home
- VMs
- Alerts
- Tasks
- SmartMotion Backup
- Configure
- Operations
- Help
- Refresh

Home

The **Home** tab displays a general status view of the appliance. The following information is presented (see Figure 3):

Active Alerts

This panel displays all the alerts that the appliance has received within the past 24 hours. The most recent alert is displayed. To view all the alerts for your vmPRO appliance, click the **See all alerts** link.

Last 24 Hrs SmartRead

This panel displays the amount of data that has been moved (backed up) within the past 24 hours. Hold the cursor over a line or bar on the chart to see details about the underlying data.

Last 24 Hrs I/O Reduction

This panel displays the amount of data reduction achieved within the past 24 hours. Hold the cursor over a line or bar on the chart to see details about the underlying data.

Summary

This pane displays the number of **Servers** and **VMs** (Virtual Machines) that the appliance is managing. If DXis are configured for additional storage, this pane displays information regarding those DXis (see Access a DXi for Additional Storage on page 78). If there are DXis configured for additional storage, the **DXi Target** link will open the native management interface for the DXi. If more than one DXi is available for extra storage, the X **Configured DXi** link (where X is the number of DXis that have been added for storage) displays the **Available Storage** dialog box (see Figure 71 on page 77).

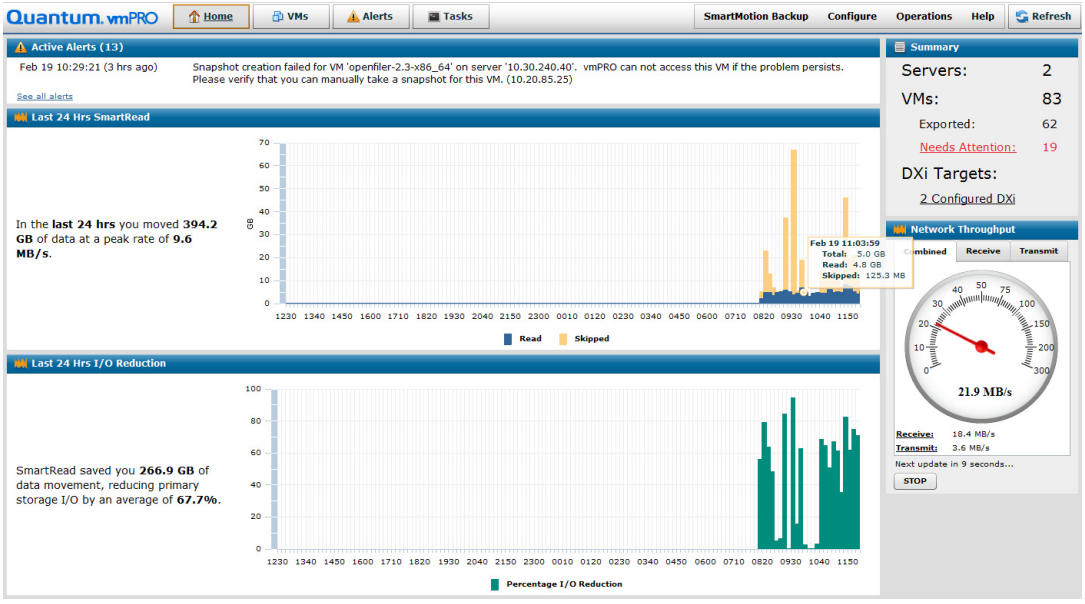
For **VMs**, the number of VMs that are **Exported** and the number that need attention are displayed. The **Needs Attention** link opens the **Resources** display (same as that accessed from the **VMs** tab) allowing you to get more information regarding the VMs that need attention.

Network Throughput

This pane displays the speed at which the current session is processing. You can select to view the throughput as **Combined** (both data received and transmitted), **Receive** (data sent to the vmPRO, such as a recovery), or **Transmit** (data sent from the vmPRO,

such as a backup). To view the network throughput, select the appropriate tab or link (Once a tab is selected, the other two choices will have links in the bottom right area of the Network Throughput pane.) You can also select **Stop** or **Start** to control when the throughput is displayed.

Figure 3 Home tab View



VMs

The **VMs** tab displays status information about the virtual machines that are resident on the appliance. The following information is presented:

Virtual Machines

The **Virtual Machines** tab (see Figure 4) displays the following information for each VM: **Name**, **Datastore**, **Server**, **Node**, **Exported**, **Size**, **VSS**, **LogTr** (log truncation), and **CBT**. The information displayed can be modified to your preferences by selecting the columns to display from the **Select Columns** drop-down list. The screen's lower pane displays a summary of the selected VM's main attributes.

You can filter the list of displayed VMs my using the **Search** option, and you can clear any search criteria by selecting **clear**.

You can modify the VMs' settings by selecting the VMs and then selecting **Edit Selected VMs** to display the **Configure Virtual Machine** dialog box. Use the **Configure Virtual Machine** dialog box to modify the VMs' configuration settings: **Node**, **Folder**, **Exported**, **Change Block Tracking Enabled**, and **VSS Configuration** settings (for Microsoft Windows-based VMS only). On the **Configure Virtual Machine** dialog box you can also access VSS information, and the VM's quiesce and log truncation settings by selecting **Configure VSS Settings** (see Enable Quiesce for VMs on page 151).

Select or clear **Automatically export new VMs** for the **Virtual Machines**. By default, when you deploy a new appliance, the *Auto-Export* feature is enabled. This setting automatically enables SmartView and SmartMotion capabilities for any new VM discovered in the vCenter inventory.

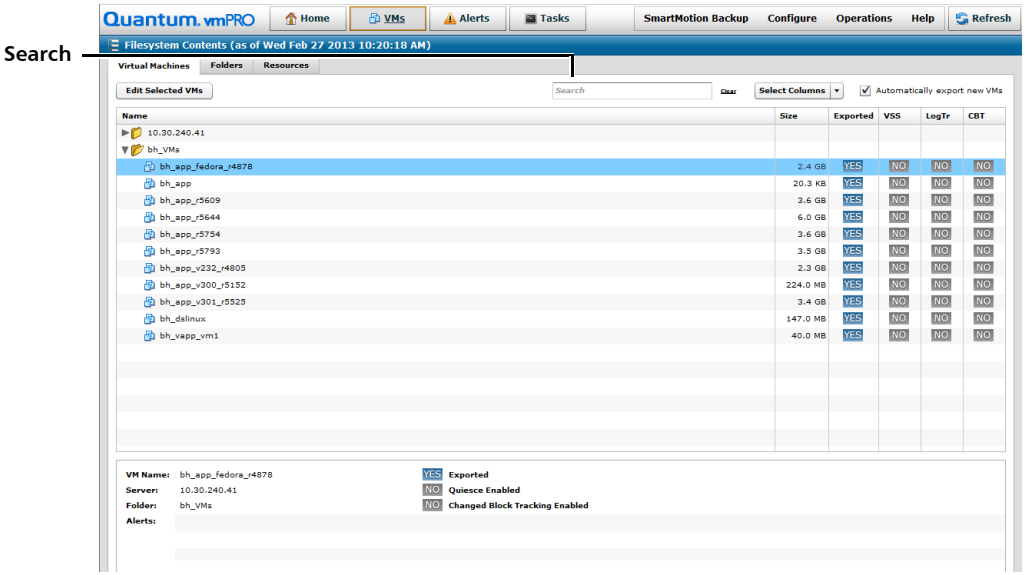
This feature is convenient for un-attended backups of remote, isolated, or fully automated vSphere environments, and it is good for scheduled backups on systems where VMs are moving from server to server frequently. With this feature enabled, the vmPRO appliance recognizes when VMware moves VMs.

Keep in mind that *automatic* does not mean set-and-forget. Each VM that is protected consumes space on the target storage device. As the population of VMs grows, so does the storage requirement. To monitor storage requirements, set the threshold at which you receive alerts regarding your capacity (see Licenses on page 33.

Please note the following when using the Auto-Export feature:

- Use Auto-Export with caution since excessive addition of VMs to a backup job may cause it to run longer than anticipated.
- Be mindful of the capacity and utilization of the target storage when using Auto-Export – too many new VMs may overburden the target.
- Use caution when enabling Auto-Export in large environments.
- Account for any new VMs that may become Auto-Exported due to a vMotion/DRS operation relocating them onto a vSphere host being managed by vmPRO, and then plan for available capacity in your backup target.

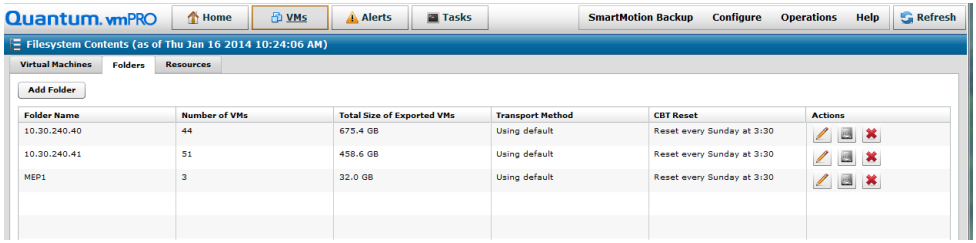
Figure 4 Virtual Machines tab



Folders

The **Folders** tab (see Figure 5) allows you to add, back up, edit (configure), or delete a folder. For each folder, the **Folder Name**, **Number of VMs**, **Total Size of Exported VMs**, **Transport Method** **CBT Reset**, and **Actions** (edit, backup, delete) are displayed. For more information regarding the use of folders, see Create and Manage Folders on page 145

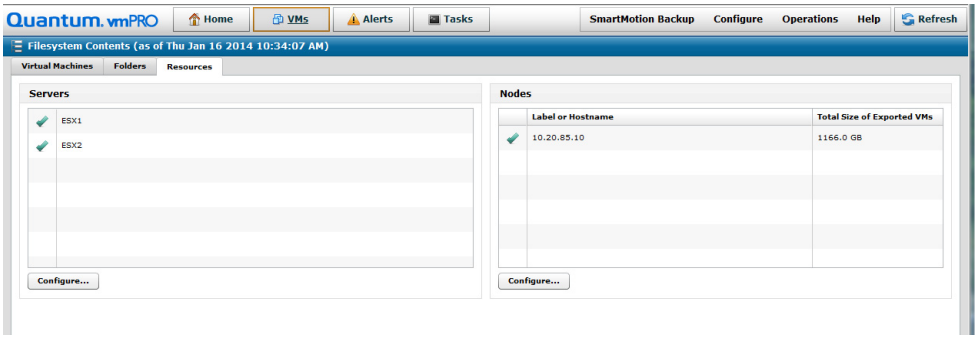
Figure 5 Folders tab



Resources

The **Resources** tab (see Figure 6) displays a list of **Servers** and a list of **Nodes.** You can add ESX servers (vCenter servers must be added through the **Congfig Wizard**), edit servers (change a server's **Label** and the authentication **Username** and **password**), or delete servers from the **Configure Serve List** dialog box. For nodes, you can edit a node's **Label**, send an email notification, or delete a node from the **Configure Node List** dialog box. The **Total Size of Exported VMs** for the nodes is also displayed.

Figure 6 Resources tab



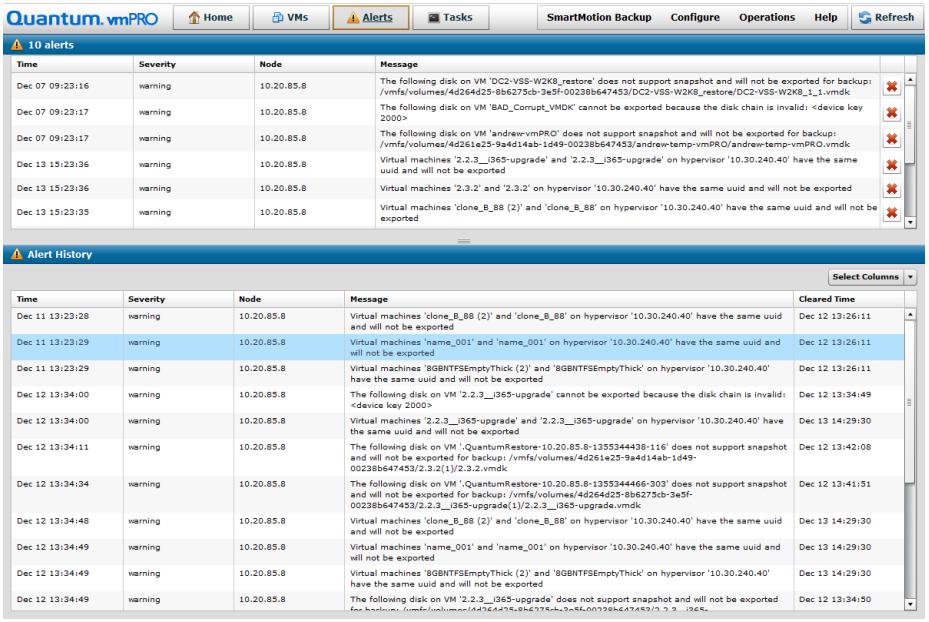
Alerts

The **Alerts** tab (see Figure 7) displays a list of current alerts and an **Alert History** list. For both lists, the following information is presented for each alert: **Time, Severity, Node,** and **Message.**

You can clear alerts that are displayed in the current alerts list by selecting the red **X** in the list's last column.

For the **Alert History** list, the **Cleared Time** and **Cleared By** columns can be displayed for each alert. The information displayed in the **Alert History** list can be modified to your preferences by selecting the columns to display from the **Select Columns** drop-down list.

Figure 7 Alerts tab


Quantum. vmPRO
Home
VMs
Alerts
Tasks
SmartMotion Backup
Configure
Operations
Help
Refresh
10 alerts
Time
Severity
Node
Message
Dec 07 09:23:16
warning
10.20.85.8
The following disk on VM 'DC2-VSS-W2K8_restore' does not support snapshot and will not be exported for backup: /vmfs/volumes/4d264d25-8b6275cb-3e5f-00238b647453/DC2-VSS-W2K8_restore/DC2-VSS-W2K8_1_1.vmdk
Dec 07 09:23:17
warning
10.20.85.8
The following disk on VM 'BAD_Corrupt_VMDK' cannot be exported because the disk chain is invalid: <device key 2000>
Dec 07 09:23:17
warning
10.20.85.8
The following disk on VM 'andrew-vmPRO' does not support snapshot and will not be exported for backup: /vmfs/volumes/4d261e25-9a4d14ab-1d49-00238b647453/andrew-temp-vmPRO/andrew-temp-vmPRO.vmdk
Dec 13 15:23:36
warning
10.20.85.8
Virtual machines '2.2.3__i365-upgrade' and '2.2.3__i365-upgrade' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 15:23:36
warning
10.20.85.8
Virtual machines '2.3.2' and '2.3.2' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 15:23:35
warning
10.20.85.8
Virtual machines 'clone_B_88 (2)' and 'clone_B_88' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Alert History
Select Columns
Time
Severity
Node
Message
Cleared Time
Dec 11 13:23:28
warning
10.20.85.8
Virtual machines 'clone_B_88 (2)' and 'clone_B_88' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 12 13:26:11
Dec 11 13:23:29
warning
10.20.85.8
Virtual machines 'name_001' and 'name_001' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 12 13:26:11
Dec 11 13:23:29
warning
10.20.85.8
Virtual machines '8GBNTFSEmptyThick (2)' and '8GBNTFSEmptyThick' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 12 13:26:11
Dec 12 13:34:00
warning
10.20.85.8
The following disk on VM '2.2.3__i365-upgrade' cannot be exported because the disk chain is invalid: <device key 2000>
Dec 12 13:34:49
Dec 12 13:34:00
warning
10.20.85.8
Virtual machines '2.2.3__i365-upgrade' and '2.2.3__i365-upgrade' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 14:29:30
Dec 12 13:34:11
warning
10.20.85.8
The following disk on VM '.QuantumRestore-10.20.85.8-1355344438-116' does not support snapshot and will not be exported for backup: /vmfs/volumes/4d261e25-9a4d14ab-1d49-00238b647453/2.3.2(1)/2.3.2.vmdk
Dec 12 13:42:08
Dec 12 13:34:34
warning
10.20.85.8
The following disk on VM '.QuantumRestore-10.20.85.8-1355344466-303' does not support snapshot and will not be exported for backup: /vmfs/volumes/4d264d25-8b6275cb-3e5f-00238b647453/2.2.3__i365-upgrade(1)/2.2.3__i365-upgrade.vmdk
Dec 12 13:41:51
Dec 12 13:34:48
warning
10.20.85.8
Virtual machines 'clone_B_88 (2)' and 'clone_B_88' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 14:29:30
Dec 12 13:34:49
warning
10.20.85.8
Virtual machines 'name_001' and 'name_001' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 14:29:30
Dec 12 13:34:49
warning
10.20.85.8
Virtual machines '8GBNTFSEmptyThick (2)' and '8GBNTFSEmptyThick' on hypervisor '10.30.240.40' have the same uuid and will not be exported
Dec 13 14:29:30
Dec 12 13:34:49
warning
10.20.85.8
The following disk on VM '2.2.3__i365-upgrade' does not support snapshot and will not be exported
Dec 12 13:34:50

Tasks

The **Tasks** tab displays information about the following topics:

Backup

The **Backup** tab (see Figure 8) displays **Recent SmartMotion Backup** activity and allows you to **View Policies**, start a backup by selecting **Start Backup**, or stop a backup by selecting **Abort Backup**. For each SmartMotion task, tabs display the following information:

Table 1 SmartMotion Task Information

VMs	Folders	Nodes	Errors[a]
• VM Name • Status • Error • Copy type • File Size • Savings • Elapsed Time • Start Time • End Time	• Folder • Num VMs (number of virtual machines) • Status • Num Errors (number of errors)	• Node • Num VMs • Status	• VM Name • Error Message

a.This tab displays only when there are errors.

View Policies allows you to **Create a new policy**, **Set default policy**, edit an existing policy, or delete a policy from the **Available Backup Policy** dialog box. For more information regarding these tasks, see Using Backup Policies on page 79.

Figure 8 Backup tab - VMs

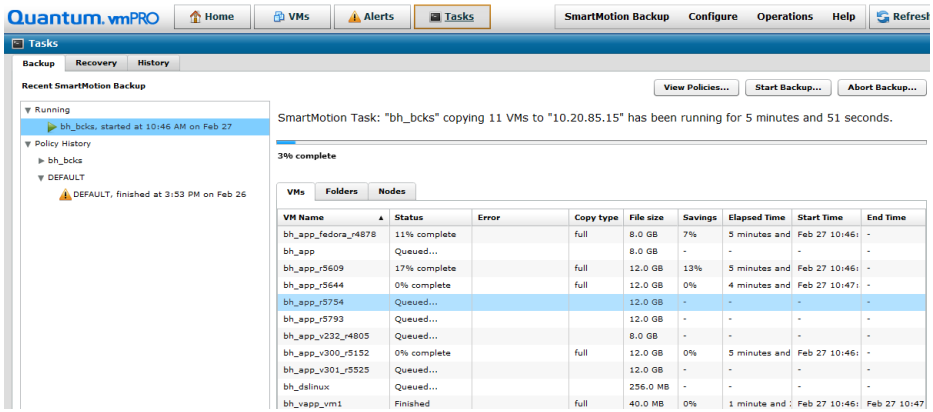


Figure 9 Backup tab - Folders

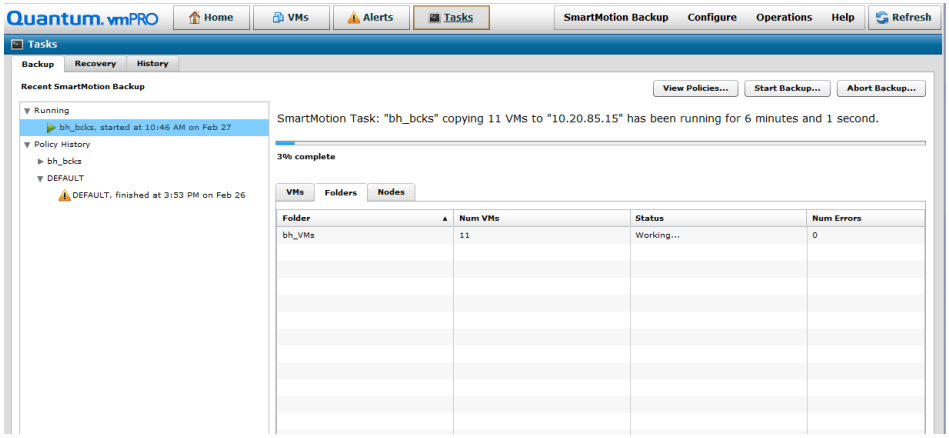


Figure 10 Backup tab - Nodes

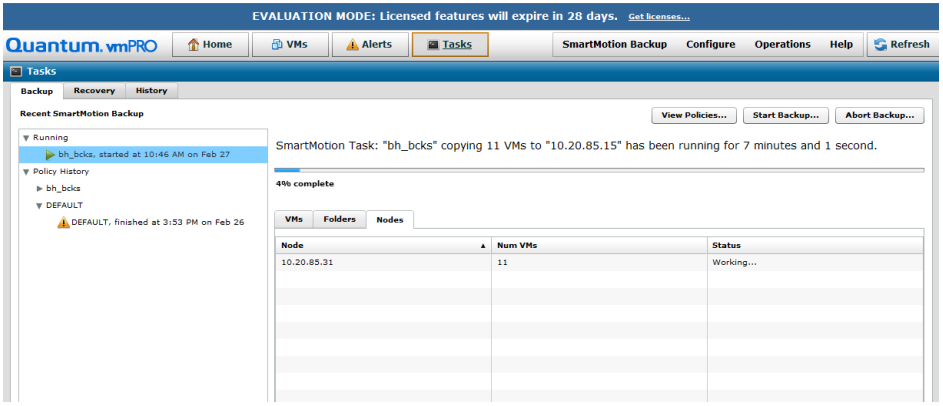
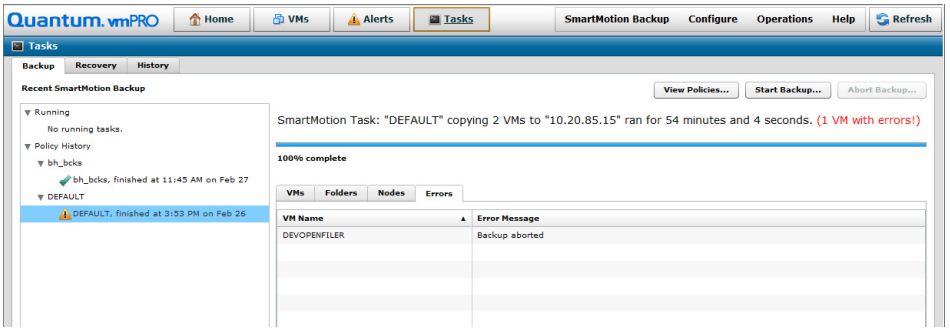


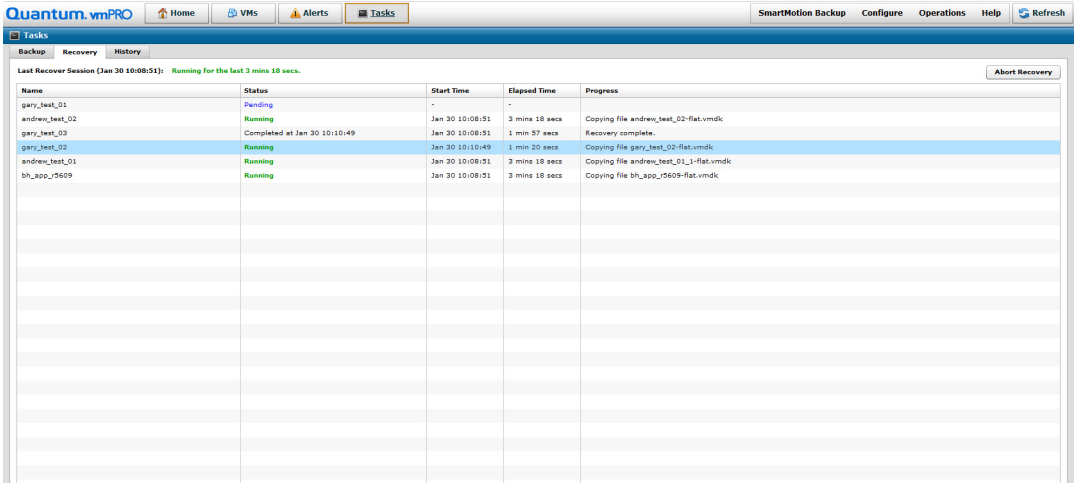
Figure 11 Backup tab - Errors



VM Recovery

The **Recovery** tab (see Figure 12) allows you to start a **Recover VMs** task. For each recovered VM, its **Name**, **Status**, **Start Time**, **Elapsed Time**, and **Progress** are displayed. Once a recovery is in process, the **Recover VMs** option will change to **Abort Recovery**.

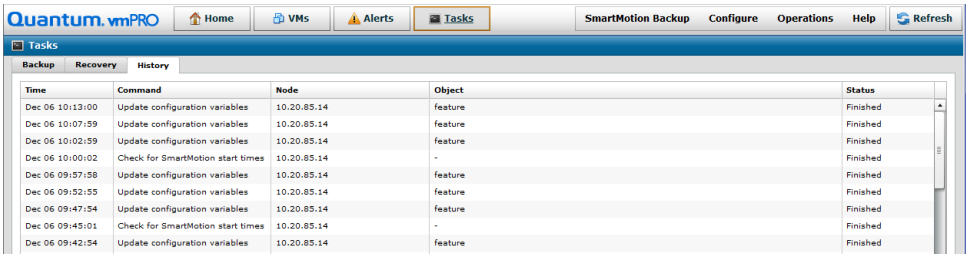
Figure 12 Recovery tab



History

The **History** tab (see Figure 13) displays the **Time**, **Command**, **Node**, **Object**, and **Status** associated with each task.

Figure 13 History tab



SmartMotion Backup

The **SmartMotion Backup** drop-down list (see Figure 14) allows you to perform the following functions:

Backup

Select **Backup** to begin a SmartMotion backup session by selecting the backup policy in the **Run SmartMotion Backup** dialog box. You can also edit the policy before starting the backup.

Recover

Select **Recover** to open the **Recover Virtual Machine Wizard** to recover VMs. You can recover all VMs, select VMs based on various filtering options, or manually choose the VMs that you want to recover. In addition, you can recover mailboxes on an exchange server.

iSCSI Targets

Select **iSCSI Targets** to view backed up virtual disks that you have exported as iSCSI targets. These iSCSI target disks can then be accessed by using the Microsoft iSCSI Initiator and then mounted as iSCSI disks on remote hosts.

The Microsoft iSCSI Initiator allows you to connect a Windows host to an external iSCSI device using an Ethernet connection. This allows you to use your existing network infrastructure to enable block-

based Storage Area Networks without the need for additional hardware.

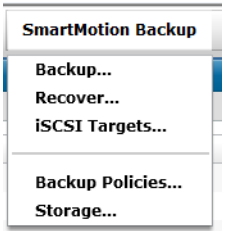
Backup Policies

Select **Backup Policies** to **Create a new policy**, **Set default policy**, edit an existing policy, edit the folder assignments for the policy, or delete a policy from the **Available Backup Policy** dialog box. For more information about creating and using backup policies, see Using Backup Policies on page 79

Storage

Select **Storage** to add, edit (configure), or delete storage from the **Available Storage** dialog box. To add or edit storage, you will enter or modify the **Hostname**, **Nickname**, **Device**, **Protocol**, **Share**, **Sub-folder**, **Mount options**, (for CIFS protocol) **CIFS User**, **CIFS** and **Password.**

Figure 14 SmartMotion Backup drop-down list



For more information regarding the use of SmartMotion, see Using SmartMotion Backup on page 72.

Configure

The **Configure** drop-down list (see Figure 15) allows you to configure or access the following components:

Servers

Select **Servers** to add a server to the appliance, modify an existing server's configuration, or delete a server from the appliance. You can enter or modify the server's **Hostname** (add), **Label**, **Username**, and **Password** in the **Configure Server** dialog box.

You can use either a single vCenter server or one or more standalone ESX hosts, but not both simultaneously. Also, if you are adding a

vCenter server, we recommend using the **Configuration Wizard** (see Servers on page 35). Since vCenter servers can be very large, the **Configuration Wizard** gives you the opportunity to designate a subset of the vCenter to be exported by the appliance.

CIFS

Select **CIFS** to configure all vmPRO CIFS shares, whichs allows you to configure your vmPRO appliance to use the CIFS protocol for your backups. You can select or clear the **Enable CIFS access** option. If you have chosen to enable CIFS access, select an **Authentication Method**, enter the **Workgroup name**, add **Users**, and select or clear the **Enable Quantum Support share** option in the **Configure CIFS** dialog box.

NFS

Select **NFS** to configure a NFS share, which allows you to configure your vmPRO to use the NFS protocol for your backups.You can select or clear the **Enable NFS Access** option. If you have chosen to enable NFS access, select **Add NFS Export** to select the **Export** path, enter the **Host Specification,** and enter any **Options** (comma separated list, such as: ro,insecure,anonid=500,no_root_squash) in the **Add NFS Export** dialog box.

For existing NFS shares, you can edit their NFS export information or delete the share from the **Client Access Control** section of the **Configure NFS** dialog box.

iSCSI

Select **iSCSI** to configure the storage area and maximum target size of the write area for a backup exposed as an iSCSI target.

Email

Select **Email** to set your **From Address** for all email sent by the appliance. You will also enter the **SMTP Server** (see Email on page 37) information in the **Configure Email** dialog box.

Reports & Alerts

Select **Reports & Alerts** to create a **Recipients** list of email addresses to receive reports and alert emails. You can also select or clear the **CC: Quantum Support Team** option, select or clear the **Email a report every day** option, select or clear the **Include CSV**

attachment on SmartMotion reports option, select or clear the **Upload a report to Quantum support site every day** option, and select the email **Format.** In addition, you can view or send the report by selecting the **View Report Now** or **Send Report Now** options in the **Configure Reports & Alerts** dialog box.

Advanced Settings

Select **Advanced Settings** to enable or disable the following features: For more information regarding these features, see Configure Advanced Settings on page 166.

- **Enable the file system integrity check during backup.**
- **Enable HotAdd Transport for all folders by default.** (Please read Enable HotAdd Transport on page 167 before enabling this feature.)
- **Skip reading of page file and swap partitions during backup.**
- **Allow a SmartMotion to run even if the same policy is already running.**
- **Disallow backups when there is not enough datastore space for snapshot**

Users

Select **Users** to add users. You can enter the **User name**, **Password**, and select users access privileges in the **Configure User List** dialog box.

Downloads

Select **Downloads** to download reports and existing support bundles by browsing to **https://<ip-address>/api/download**. You can clear or select **Enable downloadable files from the Quantum vmPRO,** clear or select **Require HTTP authentication**, and edit the **wget command** to allow downloadable files from the appliance in the **Configure Downloads** dialog box.

Software Updates

Select **Software Updates** to schedule and check for vmPRO software updates. Select **Check now** to check for software updates. You can also select to automatically check for software updates

daily or weekly in the **Configure Software Updates** dialog box. A list of currently available updates is also displayed.

Config Wizard

Select **Config Wizard** to access the **Quantum vmPRO Configuration Wizard**. The **Quantum vmPRO Configuration Wizard** initiates wizards that guide you through the configuration steps for **Licenses**, **Servers**, **File Sharing**, **Storage**, **Backup Policies Email**, **Reports & Alerts**, **Time & NTP**, and **vCenter Plugin**.

Figure 15 Configure drop-down list

Operations

The **Operations** drop-down list (see Figure 16) allows you to perform or access the following functions:

Discover Now

Select **Discover Now** to find (discover) all the virtual machines that are candidates for export (can be backed up).

View Report

Select **View Report** to display the following information: Report time, Report Reason, vmPRO URL, Admin Email, Version, System Uptime, Controller UUID, Current Alerts, Alerts from Log, Licenses, (Group Member, if the vmPRO is a member of a group) Configured

Servers, Virtual Machines, SmartMotion, Alert History, Command History, Performance History, VM Statistics, vmPRO Appliance Status, and Log files. A report is created for each SmartMotion backup policy.

Synchronize With Time Server

Select **Synchronize With Time Server** to synchronize system time with the time servers.

Gather Support Logs

Select **Gather Support Logs** to create and upload support packages to assist Quantum technical support.

Export vmPRO Configuration

Select **Export vmPRO Configuration** to save a copy of your current configuration.

Note: The vmPRO allows you to back up (save off-site) a copy of the vmPRO's current XML configuration file (see Create a new Backup Policy, Step 2 on page 81). The contents of this file allows you to restore your vmPRO's configuration in the event of a disaster recovery scenario.

Import vmPRO Configuration

Select **Import vmPRO Configuration** to import a saved configuration.

Note: Importing is only supported by vmPRO appliances with factory default settings.

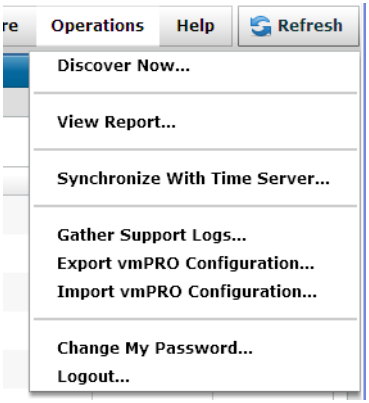
Change My Password

Select **Change My Password** to change your current password. This function changes the password for both the vmPRO GUI and the vmPRO's Console Command Line (VMware vSphere) interface.

Logout

Select **Logout** to end your current vmPRO session.

Figure 16 Operations drop-down list



Help

The **Help** drop-down list (see Figure 17) allows you to access the following vmPRO help facilities:

Online Help

Select **Online Help** to access vmPRO help information, such as Release Notes, User's Guide, Technical Notes, and Knowledge Base articles.

About

Select **About** to display the **Privacy Statement**, and to **View Additional GUI Copyright Information**, vmPRO version, Flash runtime, Quantum copyright, and Quantum patent information.

Licensing

Select **Licensing** to display the **Licensing status for this Quantum vmPRO appliance**. This information includes the following license information: **Total licensed capacity**, (amount) **Currently in use**, **Expires** (expiration date), **Days remaining** (number of days to expiration date).

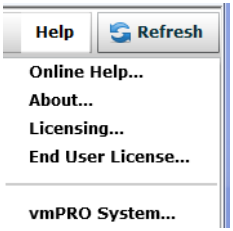
End User License

Select **End User License** to read and accept the **Quantum vmPRO End User License Agreement.**

vmPro System

Select **vmPro System** to display individual **Log Files**; **Network**, **Disk**, **CPU**, and **Memory** information; and **GUI Errors**.

Figure 17 Help drop-down list



Refresh

The **Refresh** facility allows you to refresh the current information that is being displayed by the appliance.

Chapter 2

Getting Started With Quantum vmPRO

This chapter helps you to get started with Quantum vmPRO and contains the following sections:

- Access Quantum vmPRO
- Set Up and Configure Quantum vmPRO
- Access Your Virtual Machines
- Modify Your Configuration
- Updating Quantum vmPRO Software

Access Quantum vmPRO

Once you have installed Quantum vmPRO, you will have the following three means of accessing the Quantum vmPRO appliance and its configuration:

Note: The Quantum vmPRO Configuration Wizard Welcome on page 32 displays the first time you log on to the vmPRO GUI. Each wizard leads you step-by-step through the configuration process.

- Accessing the Quantum vmPRO GUI

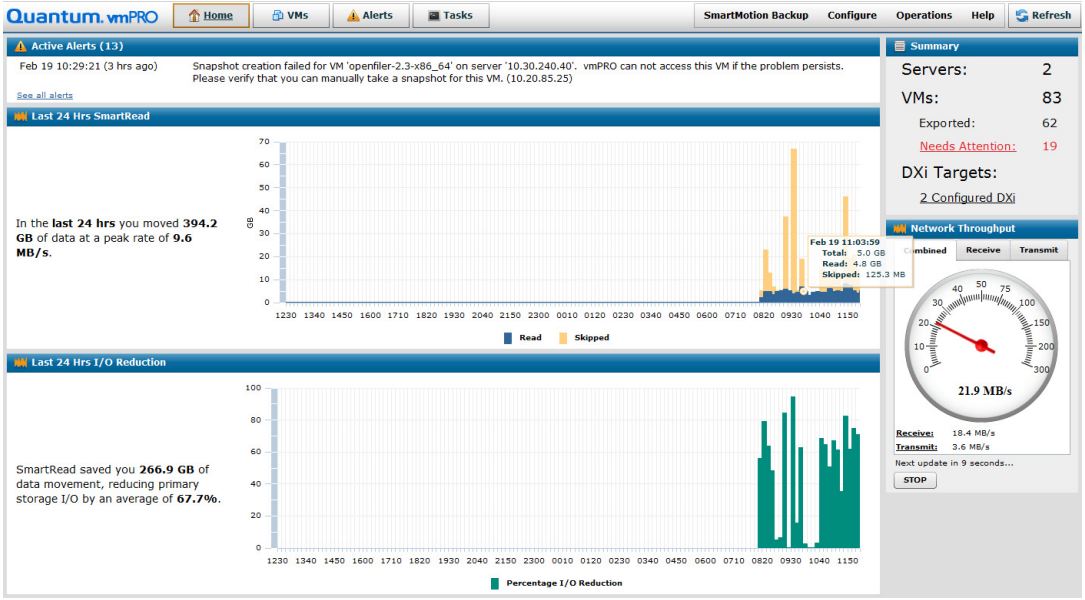
- Accessing the Console Setup Wizard
- Accessing the Console Command Line

Accessing the Quantum vmPRO GUI

The primary means of interacting with Quantum vmPRO is through its GUI (see Figure 18). Access the GUI by entering the IP address of the Quantum vmPRO appliance in the address field of your Web browser and logging in with your Quantum vmPRO appliance's username and password.

The default username/password for your appliance is **sysadmin/sysadmin**. You can change the password by selecting **Change Password** from the **Operations** drop-down list in the GUI.

Figure 18 Quantum vmPRO GUI



Accessing the Console Setup Wizard

Network settings are controlled via the console **Setup** wizard.

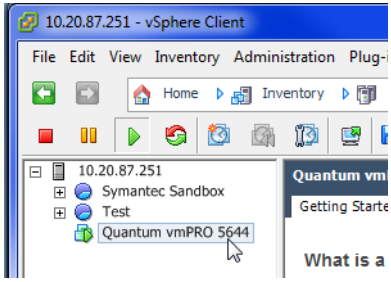
To access the **Setup** wizard:

1 Log in to your VMware vSphere Client.

2 After the vSphere client opens, if necessary, select **Home,** and then **Inventory**.

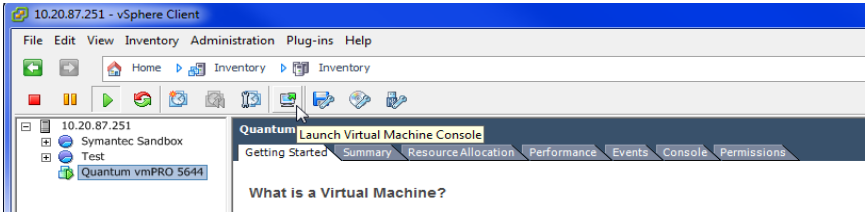
3 Select your appliance in the VMware vSphere Client's left panel (see Figure 19).

Figure 19 Select Your Appliance



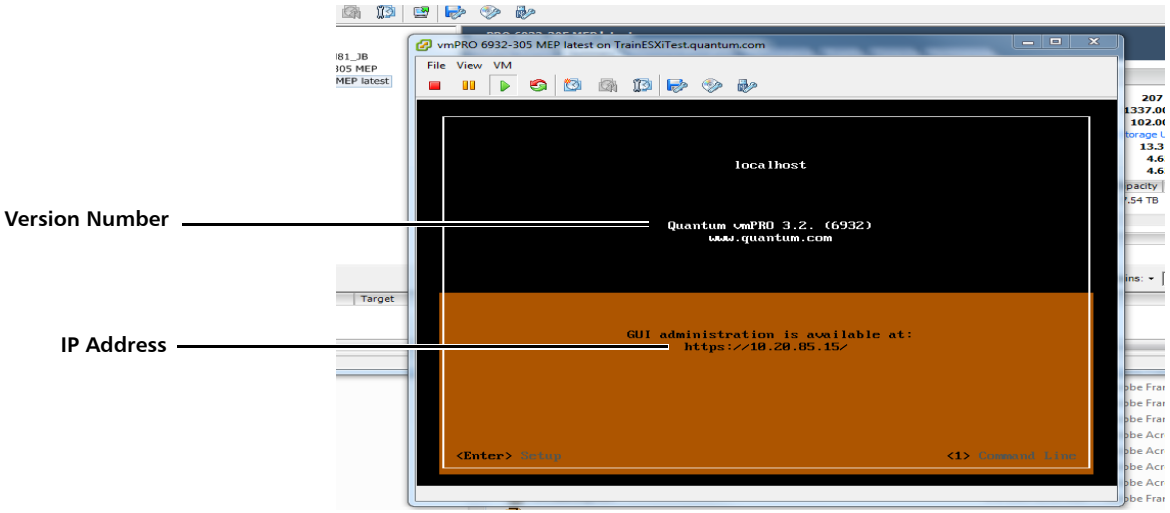
4 Select the **Console** tab in the VMware vSphere Client's right panel (see Figure 20).

Figure 20 Select the Console tab



You will see a screen displaying your Quantum vmPRO version and the IP address for your appliance (see Figure 21).

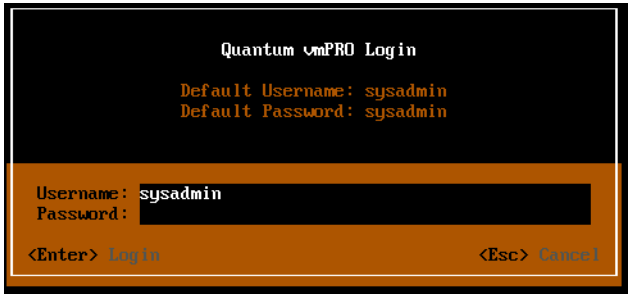
Figure 21 The Console Welcome Screen



5 Click anywhere inside the console screen, and then press **<Enter>.**

6 You will be prompted to log into your Quantum vmPRO appliance (see Figure 22). The default username and password are **sysadmin**/**sysadmin**. (See Accessing the Quantum vmPRO GUI on page 26 for information on changing your appliance's password.) After entering the default username and password, press **<Enter>**. The Console Setup Wizard displays (see Figure 24).

Figure 22 Console Login Prompt

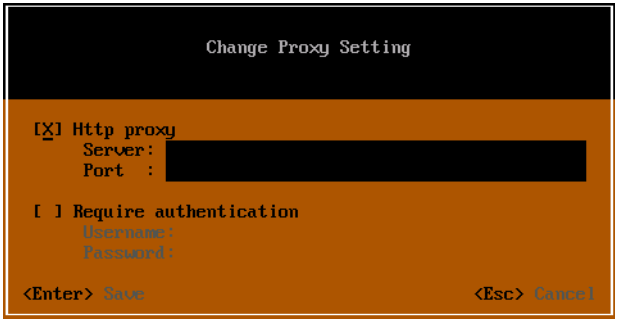


Using the Console Setup Wizard

- To free the cursor from the console screen, press **<crtl+alt>**.
- To navigate the selections, use the Up/Down arrow keys. The current setting appears in the right column, along with an explanation of that setting.
- To go to a screen that allows you to change the setting, press **<Enter>** on a setting.
- To change settings preceded by square brackets ([ ]), use the arrow keys to move the cursor to the selection.
- To activate an input area, press the spacebar. An X or * inside the brackets ([X] or [*]) indicates that the item is selected (see Figure 23).
- To save the setting, press **<Enter>**.

Note: Keyboard command reminders appear at the bottom of each screen in the **Setup** console.

Figure 23 Console Setup Wizard: Changing Settings



Accessing the Console Command Line

Occasionally you may need to use a Quantum vmPRO function via the console command line, which is accessed from your VMware vSphere client.

1 Follow steps 1through 4 of as shown in Accessing the Console Setup Wizard.

2 Click anywhere inside the console screen, and then press **<1>** to dismiss the console wizard. (If you are logged in, press **<Esc>** until you have logged out and are back at the starting screen.)

3 Log in with your appliance's username and password and you will go to the console command line.

Type **help**, and then press **<Enter>** to see a list of command line commands, or refer to the console commands list (see Console Commands and vmPRO Procedures on page 171).

To return to the **Setup** wizard, type **exit**, and then press **<Enter>.**

Set Up and Configure Quantum vmPRO

You can have Quantum vmPRO up and running in just a few minutes.

1 If you have not yet installed your Quantum vmPRO, refer to the online Quantum vmPRO Download and Installation Guide to do so now.

Note: You will need a valid e-mail address and password to access the *vmPRO Download and Installation Guide*.
For Standard Edition users, documentation, community support, and other resources are available through Forum V (http://www.quantum.com/forumv, Quantum's online support forum for virtualization products.)

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2 Refer to Network Settings on page 31 and Configure Quantum vmPRO on page 32 to finish setting up Quantum vmPRO.

Note: For Tivoli Storage Manager, after you install your Quantum vmPRO appliance, we recommend installing the TSM Linux agent in Quantum vmPRO. For more information, refer to the following online support article: Installing and using the TSM Client on a Quantum vmPRO virtual appliance

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Network Settings

To set network settings for your Quantum vmPRO appliance:

1. Log in to access the console **Setup** wizard (see Accessing the Console Setup Wizard).
2. Follow the conventions presented in Using the Console Setup Wizard to use the **Setup** wizard and enter your networking information (see Figure 24). You can set or modify the following network setting:

   - **Hostname**

     Set the virtual appliance name.

   - **Search Domains**

     Add up to 6 domains.

   - **Network**

     Set the method (DHCP or Manual) by which the IP addresses are assigned or change them if necessary.

   - **Network Reset**

     Manually reset the network.

   - **DNS Server**

     Set the method (Automatic or Manual) by which the DNS servers are set or change them if necessary.

   - **Proxy Setting**

     Change the Proxy setting and require authentication if necessary.

   - **Group Membership**

     For an explanation of **Group Membership**, see Create and Manage Folders on page 145. If you have multiple Quantum vmPRO appliances, you can group them so that you can manage several appliances from one master. You can create groups during initial setup, or you can return to the **Setup** console to manage groups later.

   - **System Shutdown**

     Manually shutdown the system.

Figure 24 Entering Networking Information

If you have dismissed the **Setup** console and are at the command line, you can return to the **Setup** console by typing **exit** at the command line. You may have to log in to return to the console.

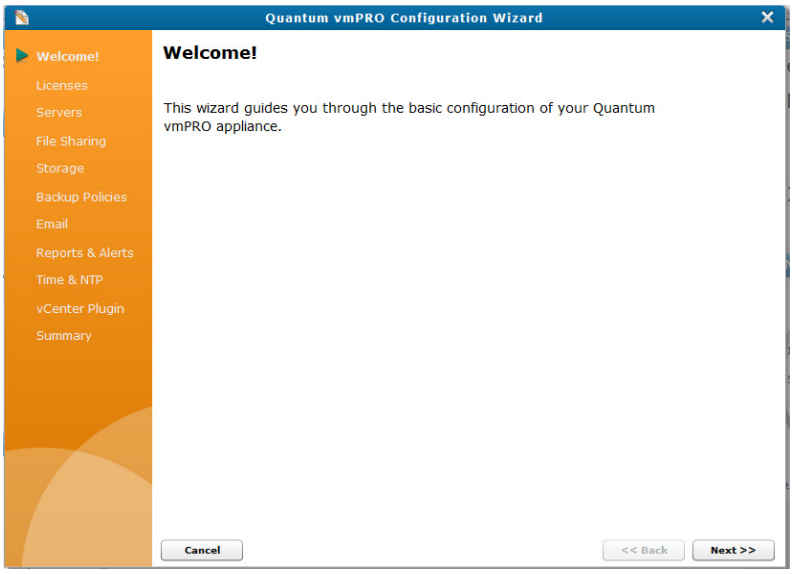
Configure Quantum vmPRO

To configure your Quantum vmPRO appliance:

1. In a browser, enter the IP address for the Quantum vmPRO appliance. This brings you to the Quantum vmPRO GUI interface.
2. Log in. (Default username/password: **sysadmin/sysadmin**.)
3. Follow the **Configuration Wizard** (see Figure 25) to configure **Licenses**, **Servers**, **File Sharing**, **Storage**, **Backup Policies**, **Email**, **Reports & Alerts**, **Time & NTP**, and **vCenter Plugin**.

Note: You can return to the **Configuration Wizard** later by selecting it from the **Configure** drop-down list in the Quantum vmPRO GUI.

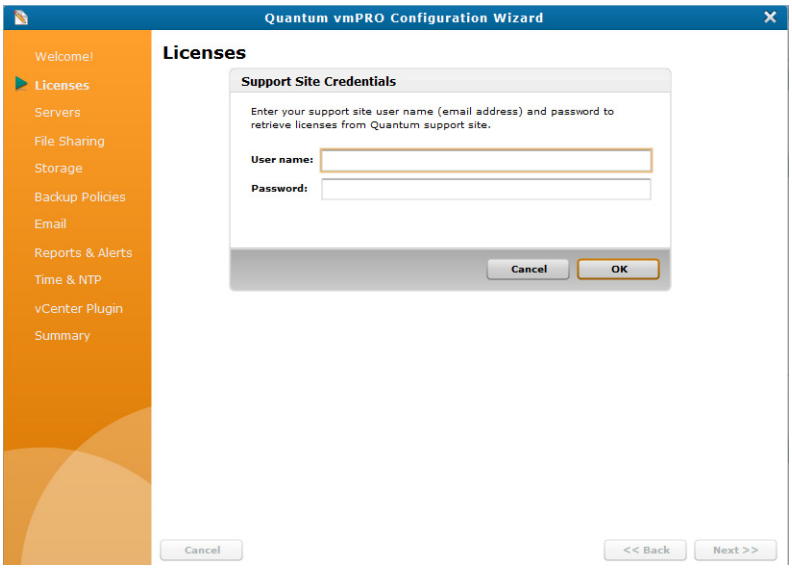
Figure 25 Configuration Wizard Welcome Screen



Licenses

Enter your registered Quantum support email address and password to retrieve your licenses (see Figure 26), and then click **Next**.

Figure 26 Support Site Credentials



Your current licenses will be listed (see Figure 27). If you think you have licenses that are not listed, select **Update Licenses from Support Site**.

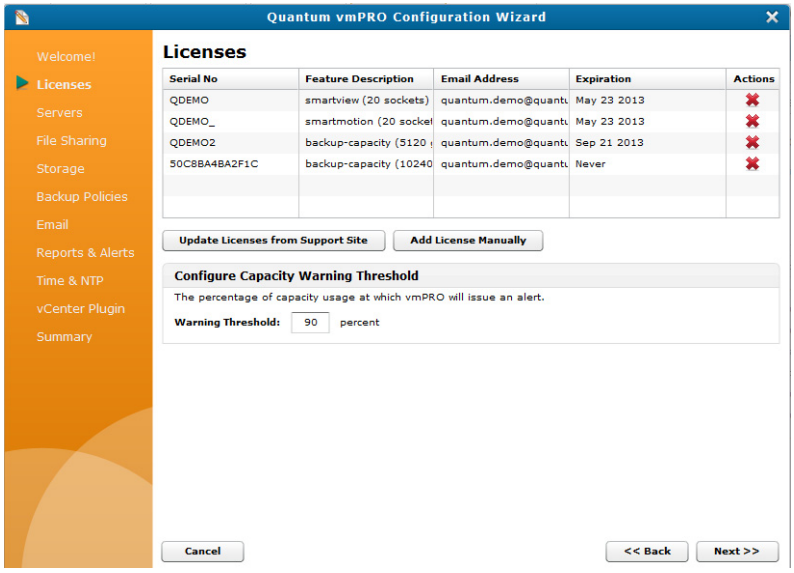
Under **Configure Capacity Warning Threshold**, you can enter the percentage of capacity at which you want vmPRO to issue an alert.

Select **Next** to install your licenses and set your capacity warning threshold.

If you are a Standard Edition customer, you will retrieve the Standard Edition license from the Web site where you received your initial contact email. You can then copy and paste the license key into the GUI and use the **Add License Manually** option to add/update your license. Standard Edition customers will not need to enter an email or password to add or update a license.

Note: If necessary, you can use the **Add License Manually** option to install a new license or if **Update Licenses from Support Site** fails to retrieve the license.

Figure 27 Current Licenses



Servers

1 Choose whether to configure a vCenter or ESX server, and then select **Next**.

When configuring the appliance, you have the option of specifying either a single vCenter server hostname for VM discovery, OR one or more standalone ESX hosts, but not both simultaneously.

If you have the option of using a vCenter server, it is recommended that you use this option, for ease of use and reduced management overhead by auto discovering all ESX hosts.

2 If you are adding an ESX server, select **Add Server**.

3 Under **Configure Server**:

- Enter the **Hostname** for the ESX server or vCenter. This will be a fully qualified name or IP address.
- Add a **Label** for your information.
- If you need to change the default server port values (Data Port: 902, and Mgmt Port: 443) click **Open Advanced Configuration**, enter the port values, and then click **OK**.

4 Under Authentication:

- Enter your **Username** and **Password.**
- Select **Test Login** to verify the connection to the ESX server or vCenter.

5 When the login information is correct, select **Save**.

- If you added an ESX server, you can add another ESX server or select **Next** until you reach the **File Sharing** section.
- If you added a vCenter, you are given the opportunity to designate a subset of the vCenter to be exported by the appliance. Check the servers/folders to be exported and select **Next**. If there are no errors, select **Next** to reach the **File Sharing** section.

File Sharing

1 Be sure that both NFS and CIFS are enabled if you want to use both, or clear the check box for the protocol you will not use.

2 Both NFS and CIFS offer further configuration options on subsequent screens.

3 If you need to set up Active Directory authentication for CIFS, you can do so after you finish the initial installation and setup of your appliance. For more information, refer to the online support article: Active Directory Authentication Support in Quantum vmPRO

Storage

You can add and configure network storage. You will need to input or select the **Hostname**, **Nickname**, **Device**, **Protocol** (NFS or CIFS), **Share**, **Sub-folder**, and **Mount options**. If you will be using a CIFS share for added storage, you can also enter its user and password information. For more information about adding and configuring storage, see Using Additional Storage on page 76.

Backup Policies

Displays a list of the current backup policies and allows you to create a new backup policy, modify an existing backup policy, designate an existing backup policy as the default backup policy, or delete a backup

policy. For more information about creating and using backup policies, see Using Backup Policies on page 79.

Email

In **'From' Address**, enter the email address that should be used in the From field on all email sent by the Quantum vmPRO appliance. Enter the hostname or IP address of your **SMTP Server**, the **Port** number, select or clear **Use TLS**, select or clear **Use SMTPAUTH** (if you chose to use SMTPAUTH, enter your login details). Select **Send Test Email** to verify that you entered the information correctly. For more information, see Emails, Reports, Alerts, and Autosupport on page 62.

Reports and Alerts

Enter recipients for email messages containing reports and alerts. Select or clear the **CC: Quantum Support Team** option, select or clear the **Email a report every day** option, select or clear the **Include CSV attachment on SmartMotion reports** option, and select the email **Format**. For more information, see Emails, Reports, Alerts, and Autosupport on page 62.

Time and NTP

To set the time:

Note: Use of an NTP server is highly recommended. Unpredictable errors can occur if the system date and time are not consistent within the VMware environment.

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1. Select your time zone. The time zone of the Quantum vmPRO appliance and the vCenter or ESX server(s) must match.
2. Choose whether to **Enable NTP**. If you chose to enable NTP, select the appropriate **NTP Host**. If necessary, you can edit the NTP server or delete an NTP server.
3. If you want to use your own NTP server, select **Add NTP Server**.

vCenter Plugin

The Quantum vmPRO GUI can be embedded directly into vSphere Client when it is connected to a vCenter Server. See the section Embed the Quantum vmPRO GUI in vSphere Client on page 155 for complete information.

Summary Screen

Be sure to select **Save**, **Next** (to review your changes), and **Finish** at this screen to save your changes.

View Your Virtual Machines

When you have completed configuring your vmPRO, you can see the virtual machines in the configured server(s). On the vmPRO GUI, select the **VMs** tab. On the VMs screen, select the **Virtual Machines** tab. Your configured server will appear on the **Virtual Machines** tab as a folder which you can open to see the VMs (see Figure 28).

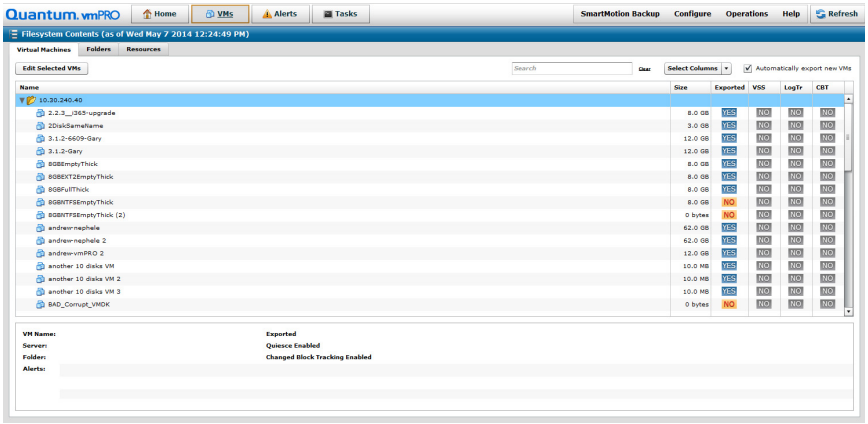


Figure 28 Viewing Virtual Machines

Access Your Virtual Machines

Both CIFS and NFS see the Quantum vmPRO appliance as a single file system as long as you have enabled CIFS and/or NFS in order to make **/export** available.

If you need to enable or configure CIFS or NFS, go to the **Configure** drop-down list in the Quantum vmPRO GUI.

SmartMotion NAS Target Protocol Selection

Depending on the makeup of the VMs populating your vSphere environment, their applications, and the data within them, you may choose between the CIFS and NFS protocols for sending backup data, based on which is a best fit.

For example, if you would like the SmartMotion backup files on the DXi or other NAS to be directly available to Windows systems, you may prefer to use the CIFS protocol. When UNIX/Linux/vSphere host integration is a priority, you may determine NFS to be more appropriate.

Additionally, depending on the contents of the data inside the VM disks, you may observe substantially different performance characteristics during backup and recovery between the two protocols.

Since no two vSphere environments are entirely alike, you should conduct a test backup and recovery with at least 40 GB worth of data over each protocol to observe the throughput and job completion time characteristics. This will allow you to choose the protocol best suited to your operations.

Protocol Considerations

Some protocol considerations to keep in mind include:

- The NFS protocol type is supported as a Datastore type by vSphere.
- VMware vSphere ESX hosts can mount a SmartMotion NAS backup target to allow for direct recovery of the backup images when using the NFS protocol to send backup data.
- The appliance supports using a *sparse writing* approach when sending backup images. Sparse writing reduces the I/O overhead and time required for a backup job.

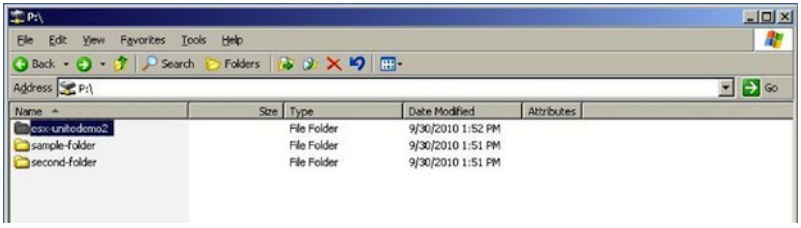
- For Linux users accessing the vmPRO **/export** share, we strongly recommend the use of the NFS protocol. If Linux users must use the CIFS protocol, the **directio** mount option must be specified in the **mount** command on the Linux machine that is mounting the vmPRO **/export** share using the CIFS protocol, for example:
  # mount.cifs -o ..,directio <share> <mount point>

CIFS

On a Windows server, you can map **\\<vmPRO-Host_IP>\export** as a network drive. To do so, go to **Start > My Computer**. From the **Tools** menu in the **My Computer** window, select **Map Network Drive**.

You can then access all of your ESX servers and virtual machines through the mapped network drive (see Figure 29). You can even use drag and drop to copy a running virtual machine.

Figure 29 Mapping a Network Drive



NFS

On a UNIX server, you can create a mount point on the server, and then NFS mount **<vmPRO-Host>:/export** on the server's mount point.

Modify Your Configuration

You can modify your Quantum vmPRO appliance's setup at any time. Networking settings are managed via the console **Setup** wizard, and most other configuration is managed via the Quantum vmPRO GUI.

See Access Quantum vmPRO on page 25 if you need reminders for accessing the **Setup** wizard or the Quantum vmPRO GUI.

This section contains instructions for common modifications you might need to make.

Configuration Wizard Reminders

Any time you make configuration changes using the wizard, you must exit the wizard using the **Summary** option to save your updates.

Saving Your Configuration Changes

To save your configuration change, do the following:

1 From the **Configuration Wizard**, select **Summary**. You will see a summary of all your changes (see Figure 30).

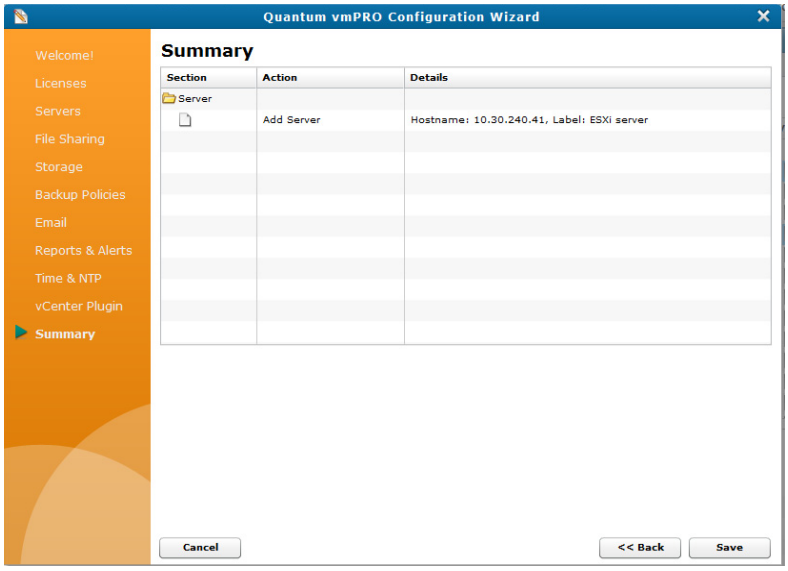


Figure 30 Configuration Wizard: Exiting the Wizard

2 Select **Save**.

3 Select **Next**.

4 On the final screen, select **Finish**.

Discovering Newly Added Servers

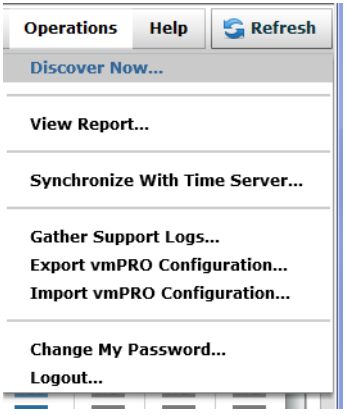
Before your Quantum vmPRO appliance can *see* the new servers that you have added, they must be *Discovered*. This discovery process usually

takes place automatically; however, there are times when you might want to run a discovery manually, possibly as troubleshooting tool.

To discover newly added servers, do the following:

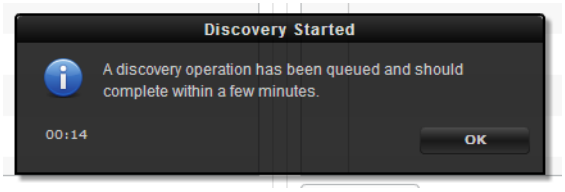
From the **Operations** drop-down list, select **Discover Now** (see Figure 31).

Figure 31 Discover Now



The **Discovery Started** alert box displays (see Figure 32).

Figure 32 Discovery Started

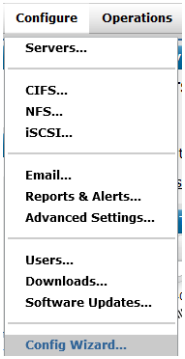


Accessing the Servers

You will use the **Servers** section of the **Configuration Wizard** to add, edit, or delete servers configured for your Quantum vmPRO appliance.

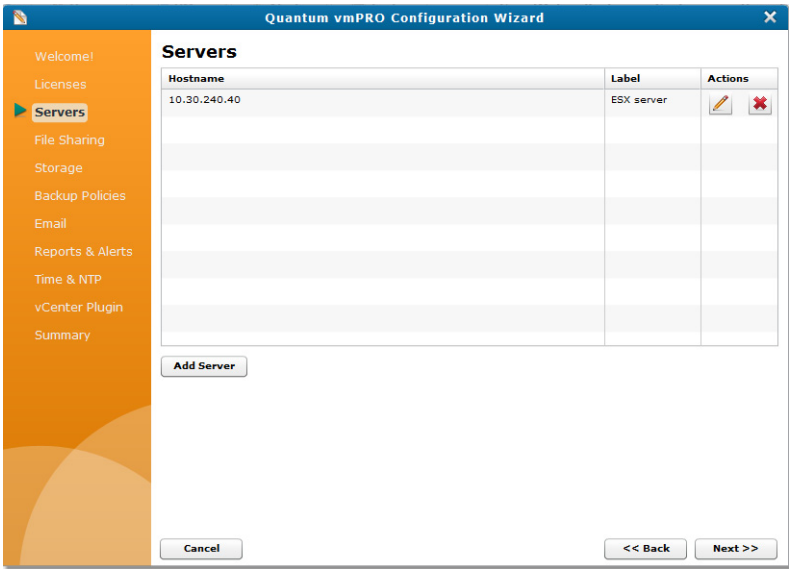
1 From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Config Wizard** (see Figure 33).

Figure 33 Accessing the Configuration Wizard



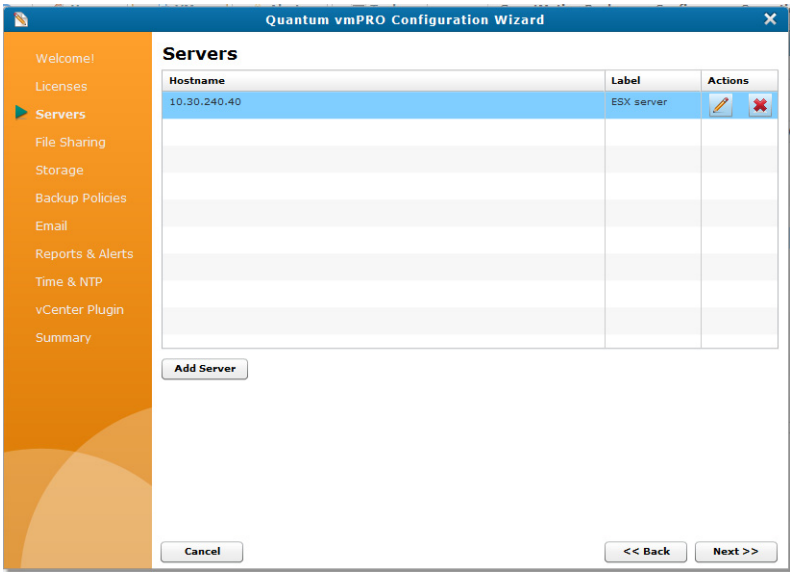
2 From the **Configuration Wizard** welcome screen, select **Servers** (see Figure 34).

Figure 34 Configuration Wizard: Welcome



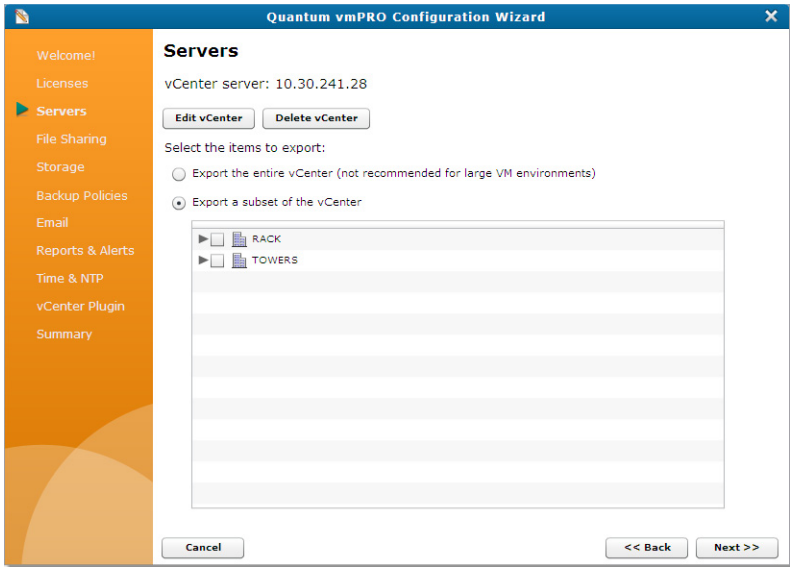
If you currently have an ESX server or servers configured, the **Servers** list will open (see Figure 35).

Figure 35 Configuration Wizard: ESX Servers List



If you currently have a vCenter configured, the **vCenter server** screen will open (see Figure 36).

Figure 36 Configuration Wizard: Servers (vCenter)



Add an ESX Server

To add an ESX Server, do the following:

1. Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.
2. At the **Servers** list, select **Add Server**.
3. Select **ESX Server (multiple ESX servers may be managed)** (see Figure 37). If you currently have an ESX server or servers configured, you will not see this screen, proceed to Step 6.

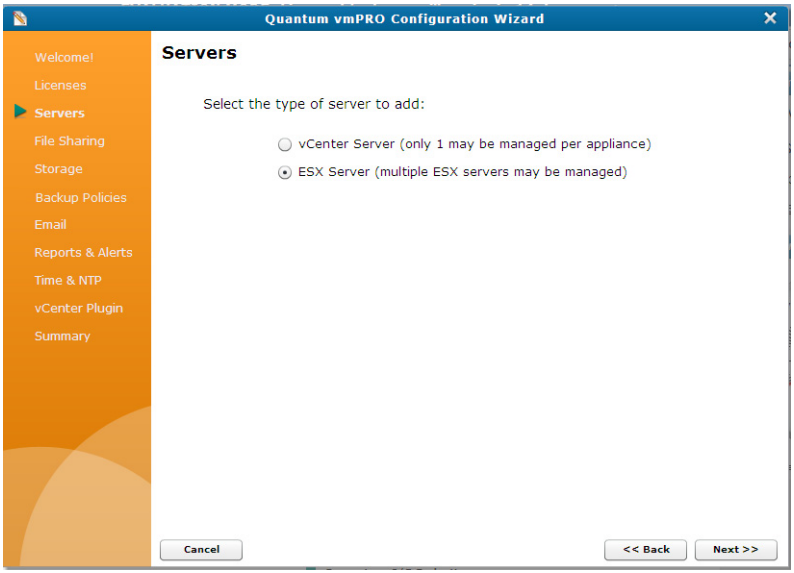
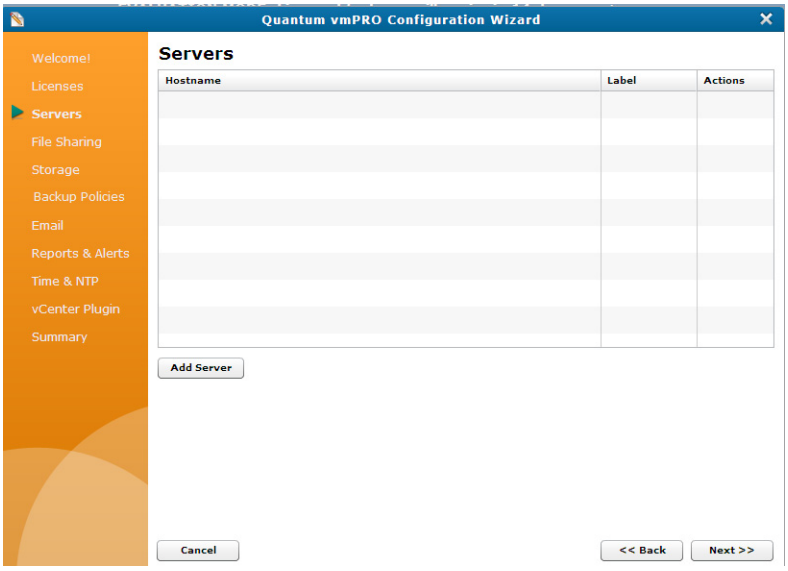


Figure 37 Configuration Wizard: Select Server Type

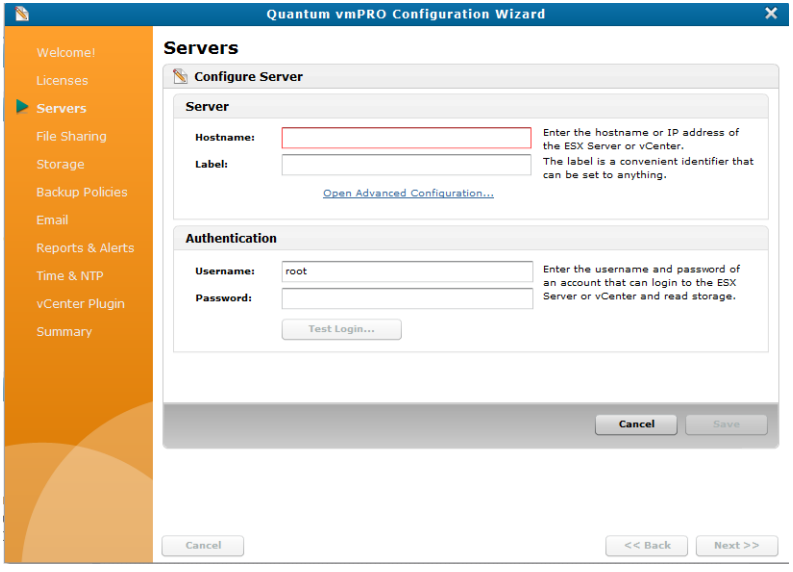
4. Select **Next**.
5. At the **Servers** list, select **Add Server** (see Figure 38).

Figure 38 Configuration Wizard: Add Server



6 Fill in the **Configure Server** form (see Figure 39). If you need to change the default port settings (Data Port: 902, Mgmt Port 443), click **Open Advanced Configuration**, enter the port values, and then click **OK**.

Figure 39 Configuration Wizard: Configure Server

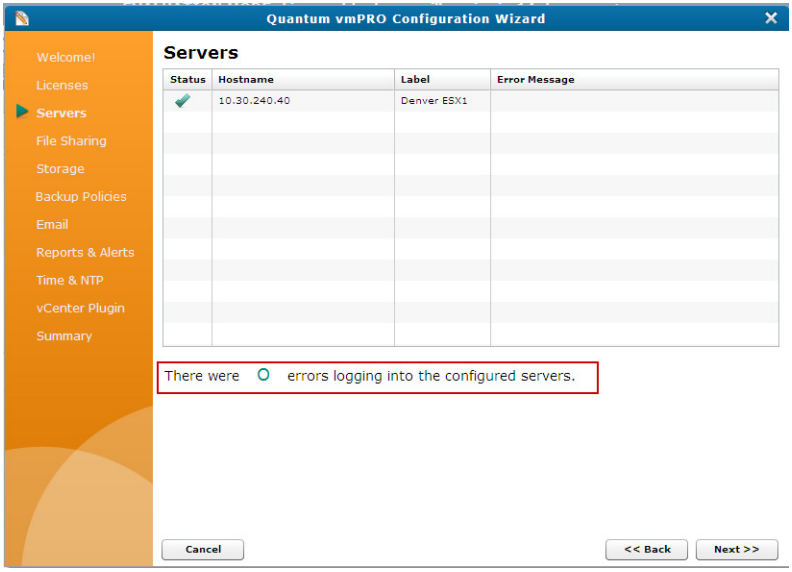


7 Select **Save**.

8 Select **Next**.

9 You will see a verification of your new configuration (see Figure 40).

Figure 40 Configuration Wizard: Configure Server Verification



10 From the **Configuration Wizard**, select **Summary** to go to the summary screen and make your changes permanent.

11 Select **Save**, then **Next**, then **Finish**.

Add an ESX Server When There is an Existing vCenter Server

A Quantum vmPRO appliance cannot be configured with both an ESX server and a vCenter at the same time. You will have to delete the vCenter and then add the ESX server.

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

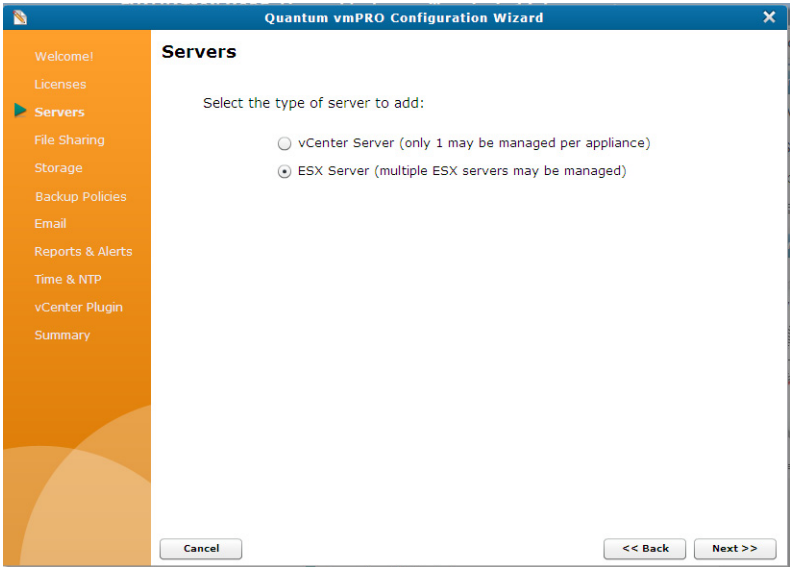
2 At the **vCenter server** screen, select **Delete vCenter**. You will see the message **No vCenter is configured** (see Figure 41).

Figure 41 Configuration Wizard: No vCenter is Configured

3 From the **No vCenter is configured** screen, select **Back**.

4 Select **ESX Server** (see Figure 42).

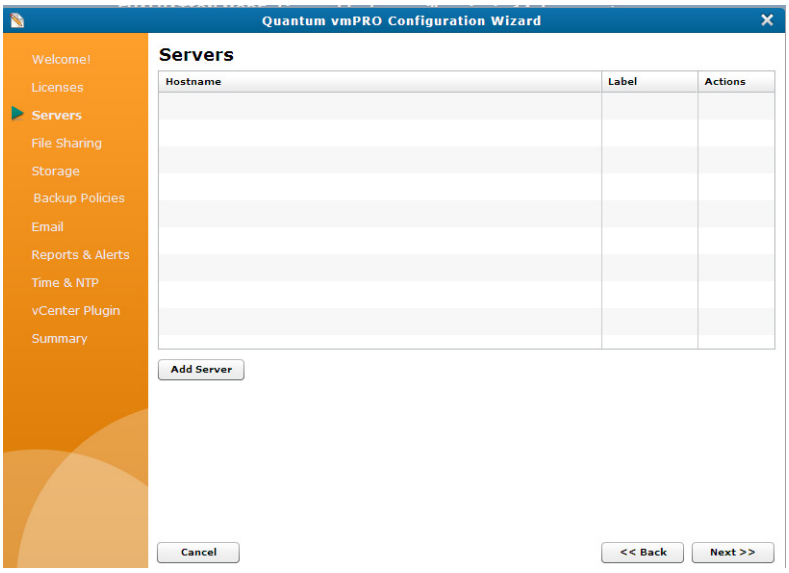
Figure 42 Configuration Wizard: Select Server Type



5 Select **Next**.

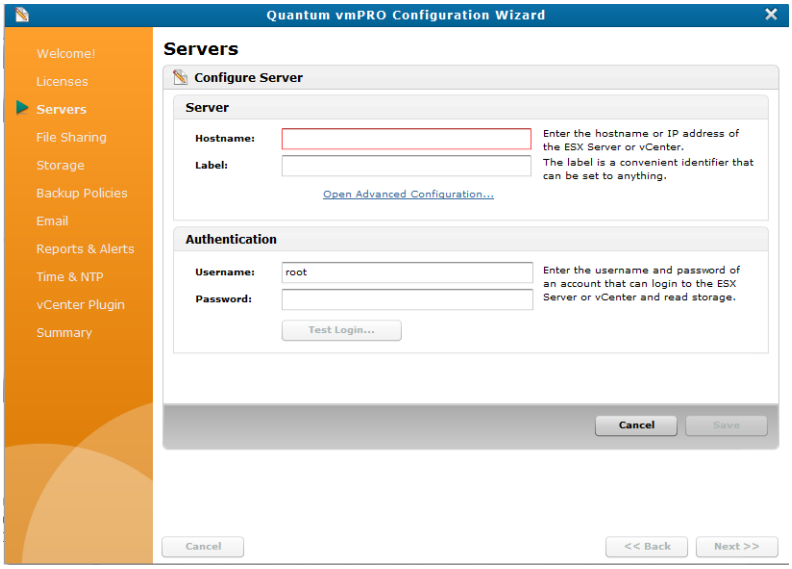
6 At the **Servers** list, select **Add Server** (see Figure 43).

Figure 43 Configuration Wizard: Add Server



7 Fill in the **Configure Server** form (see Figure 44). If you need to change the default port settings (Data Port: 902, Mgmt Port 443), click **Open Advanced Configuration**, enter the port values, and then click **OK**.

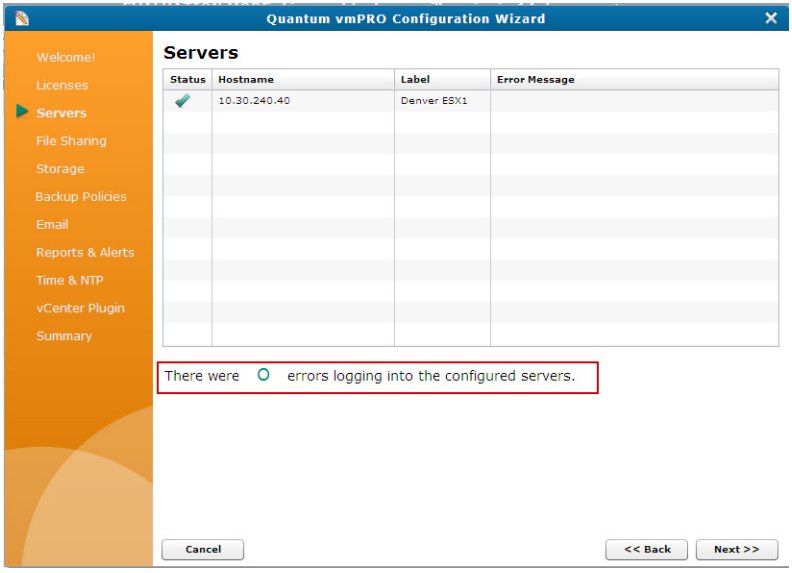
Figure 44 Configuration Wizard: Configure Server



8 Select **Save** and you will see your server added to the list.

9 Select **Next** and you will see a verification of your new configuration. (see Figure 45).

Figure 45 Configuration Wizard: Configure Server Verification



10 From the **Configuration Wizard**, select **Summary** to go to the summary screen and make your changes permanent.

11 Select **Save**, then **Next**, then **Finish**.

Add a vCenter Server

A Quantum vmPRO appliance only supports one vCenter server at a time. You must delete all existing servers (ESXs and vCenter) and then add the new vCenter server.

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

2 If no servers are configured, proceed to Step 3.
If there are any existing servers, delete them.

- To delete a vCenter:

  a At the **vCenter server** screen, select **Delete vCenter**. You will see the message, **No vCenter is configured** (see Figure 46).

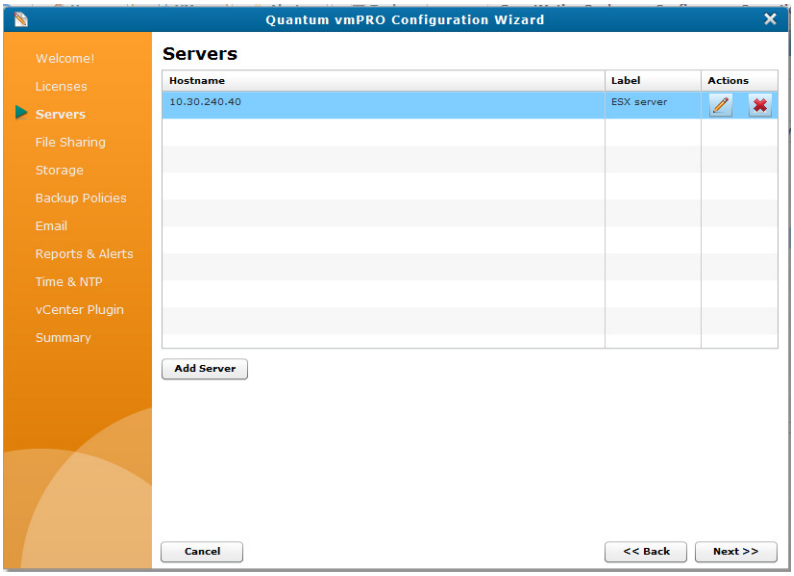
  b Select **Add vCenter**.

Figure 46 Configuration Wizard: No vCenter is Configured

- To delete ESX servers:

a Select the red **X** icon in the **Actions** column of the **Servers** list. The server will be removed from the list (see Figure 47).

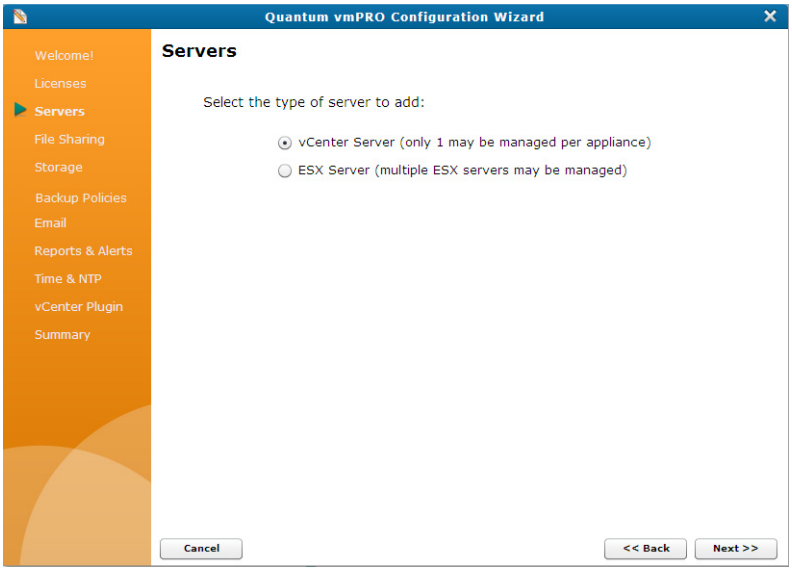
Figure 47 Configuration Wizard: Servers List



b Select **Back**.

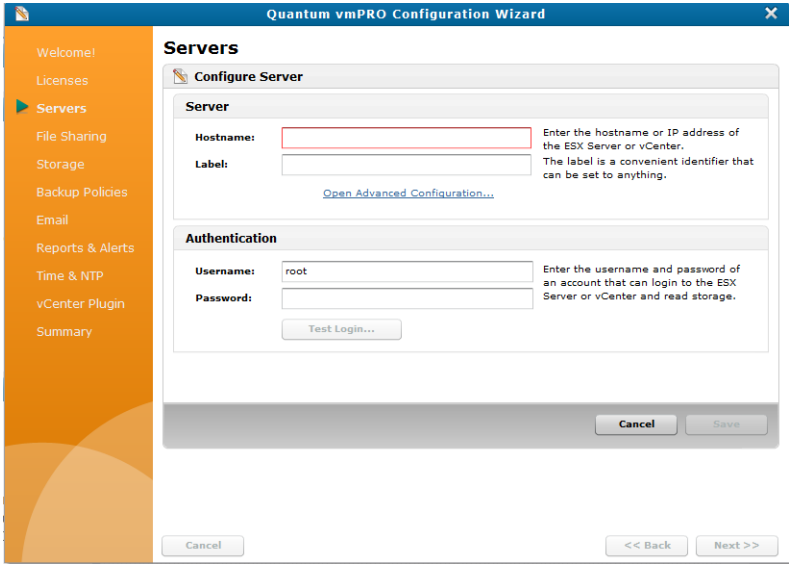
3 Select **vCenter Server**, and then select **Next** (see Figure 48).

Figure 48 Configuration Wizard: Select Server Type



4 Fill in the **Configure Server** form (see Figure 49). If you need to change the default port settings (Data Port: 902, Mgmt Port 443), click **Open Advanced Configuration**, enter the port values, and then click **OK**.

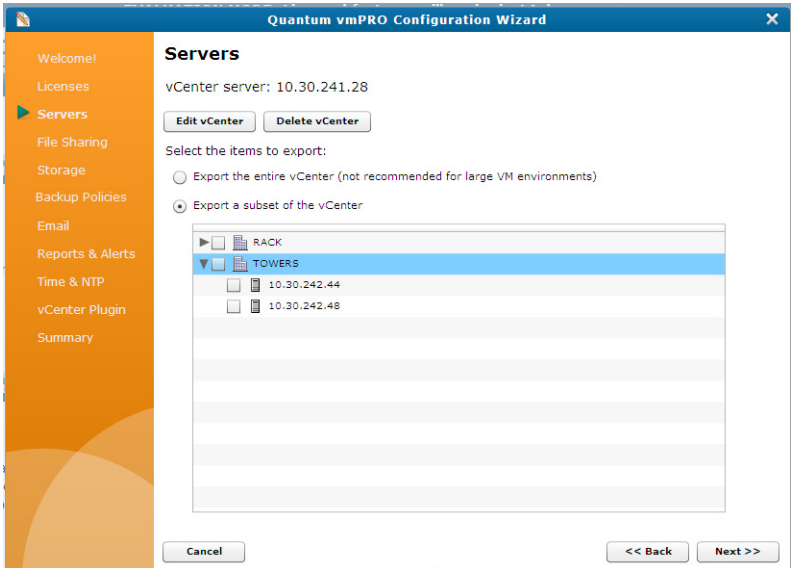
Figure 49 Configuration Wizard: Configure Server



5 Select **Save**.

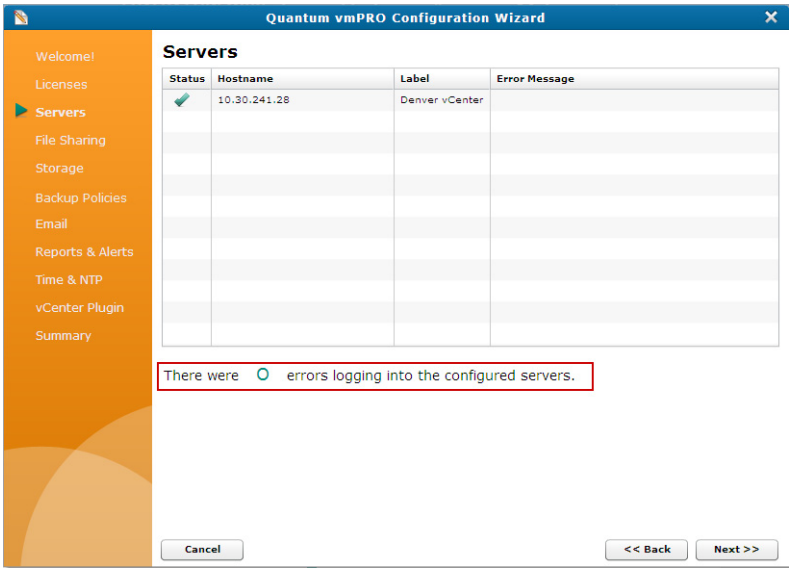
6 Select whether to export your entire vCenter or a subset. If you select the subset option, you will need to select the items to export (see Figure 50).

Figure 50 Configuration Wizard: Selecting Items to Export



7 Select **Next,** and you will see a verification of your new configuration (see Figure 51).

Figure 51 Configuration Wizard: Configure Server Verification



8 From the **Configuration Wizard**, select **Summary** to go to the summary screen and make your changes permanent.

9 Select **Save**, then **Next**, then **Finish**.

Edit a ESX Server

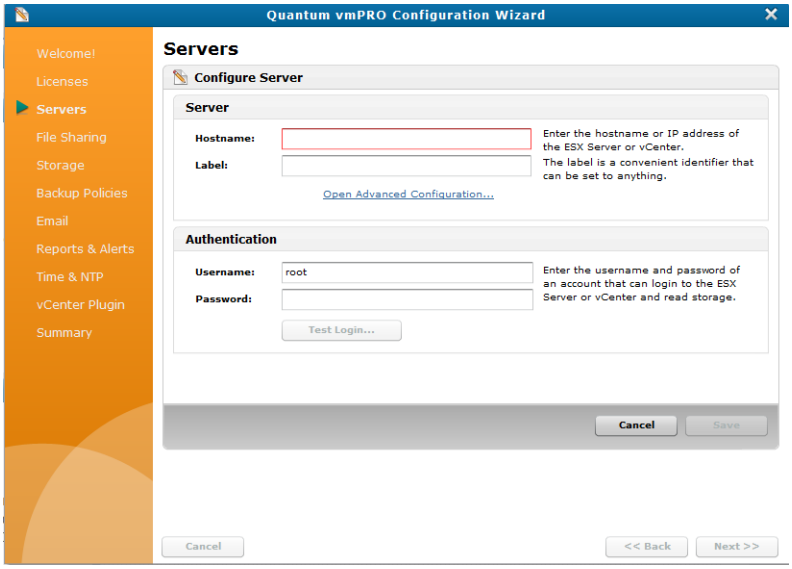
To edit an ESX Server, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

2 Select the pencil icon in the **Actions** column of the **Servers** list.

3 Edit the **Configure Server** form (see Figure 52). If you need to change the default port settings (Data Port: 902, Mgmt Port 443), click **Open Advanced Configuration**, enter the port values, and then click **OK**.

Figure 52 Configuration Wizard: Configure Server

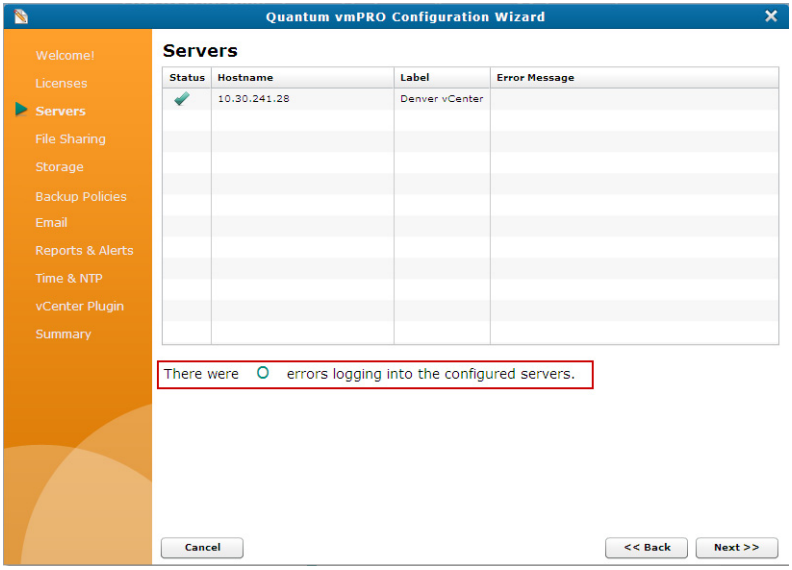


4 Select **Save**.

5 Select **Next**.

6 You will see a verification of your new configuration (see Figure 53).

Figure 53 Configuration Wizard: Configure Server Verification



7 From the **Configuration Wizard**, select **Summary** to go to the summary screen and make your changes permanent.

8 Select **Save**, then **Next**, then **Finish**.

Edit a vCenter Server

To edit a vCenter, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

2 Select **Edit vCenter**.

3 Edit the **Configure Server** form (see Figure 54). If you need to change the default port settings (Data Port: 902, Mgmt Port 443), click **Open Advanced Configuration**, enter the port values, and then click **OK**.

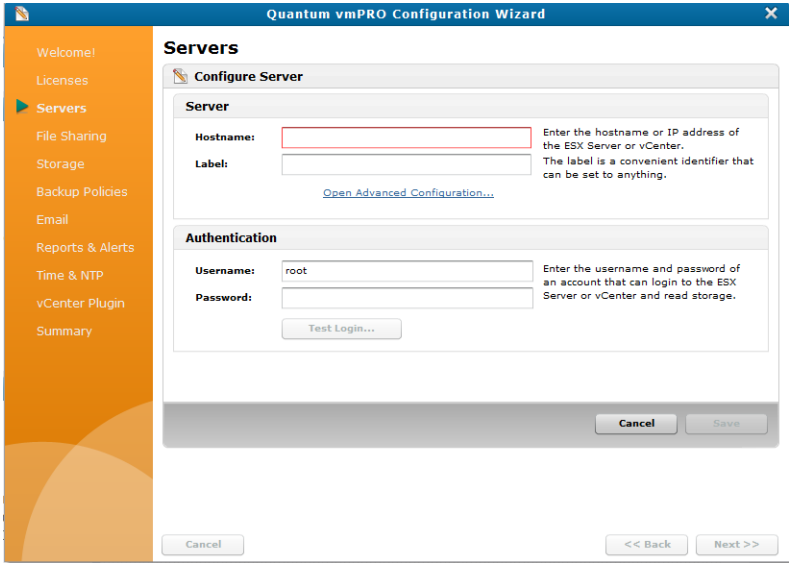


Figure 54 Configuration Wizard: Configure Server

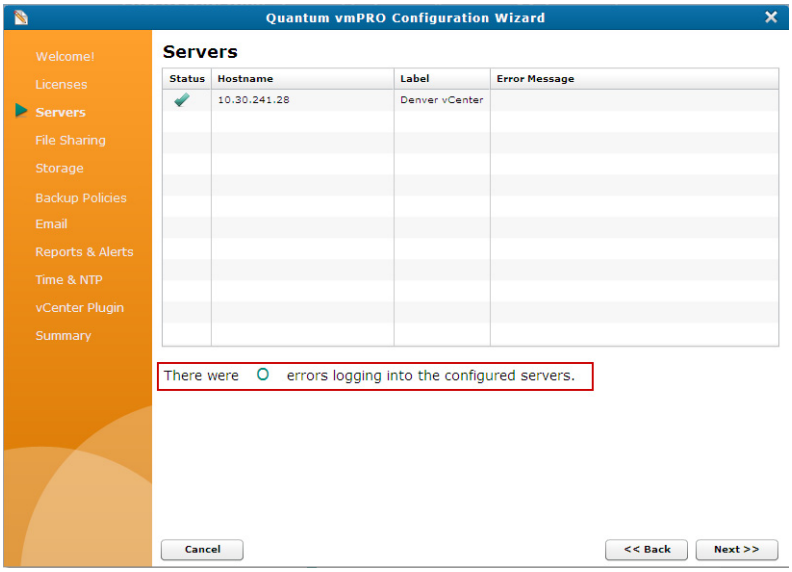
4 Select **Save**.

5 Make changes if needed to your **Export** selections.

6 Select **Next**.

7 You will see a verification of your new configuration (see Figure 55).

Figure 55 Configuration Wizard: Configure Server Verification



8 From the **Configuration Wizard**, select **Summary** to go to the summary screen and make your changes permanent.

9 Select **Save**, then **Next**, then **Finish**.

Delete ESX Servers

To delete one or more ESX servers, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

2 Select the red **X** icon in the **Actions** column of the **Servers** list. The server will be removed from the list.

3 If one or more ESX servers remain, you can save the new configuration by selecting **Summary**, and then selecting **Save**, then **Next**, and then **Finish**.

OR

If you deleted the only configured server, you need to add a new server.

- Add a new ESX server:

  a Select **Add Server**.

b Follow the wizard; see complete instructions to Add an ESX Server on page 45.

- Add a new vCenter server:
  a Select **Back** at the bottom of the **Servers** screen.
  b Select **vCenter**.
  c Select **Next**.
  d Select **Add Server** and add a new server as described in the section Add a vCenter Server on page 51.

Delete a vCenter Server

To delete a vCenter Server, do the following:

1 Open the **Servers** section of the **Configuration Wizard** as described in Accessing the Servers on page 42.

2 Select **Delete vCenter** (see Figure 56).

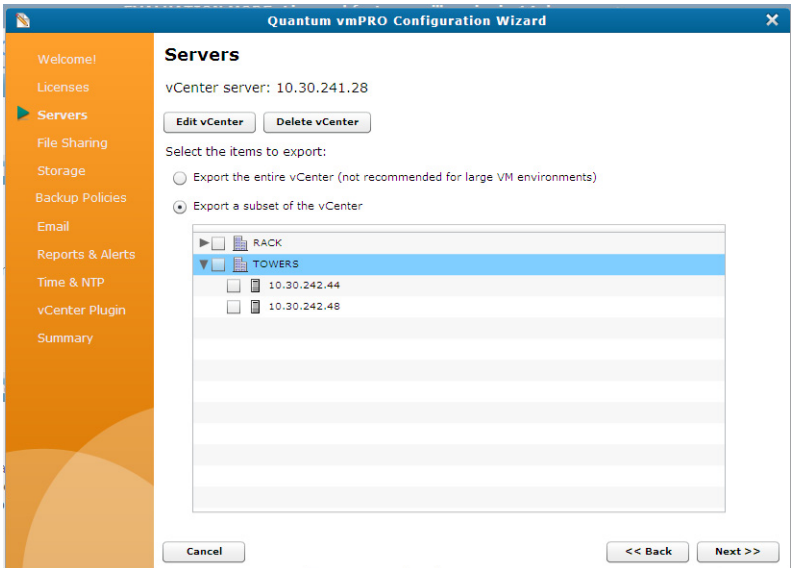


Figure 56 Configuration Wizard: Deleting a Server

You will see the message **No vCenter is configured** (see Figure 57).

Figure 57 Configuration Wizard: No vCenter is Configured

3 You must now configure a new server.

- Configure a new vCenter server:
  - **a** From the **No vCenter is configured** screen, select **Add vCenter**.
  - **b** Add a new server as described in the section Add a vCenter Server on page 51.
- Configure an ESX server:
  - **a** From the **No vCenter is configured** screen, select **Back**.
  - **b** Select **ESX server** and select **Next**
  - **c** Select **Add Server** and configure a new ESX server as described in the section Add an ESX Server on page 45.

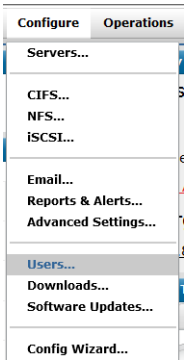
Manage Users

Quantum vmPRO has two levels of user privilege: Admin and User. Admin users have full privileges, while those with User privileges are more limited to basic operations, and cannot make configuration changes.

Create and manage users from the Quantum vmPRO GUI. See Access Quantum vmPRO on page 25 for information on accessing the GUI.

1 From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Users** (see Figure 58).

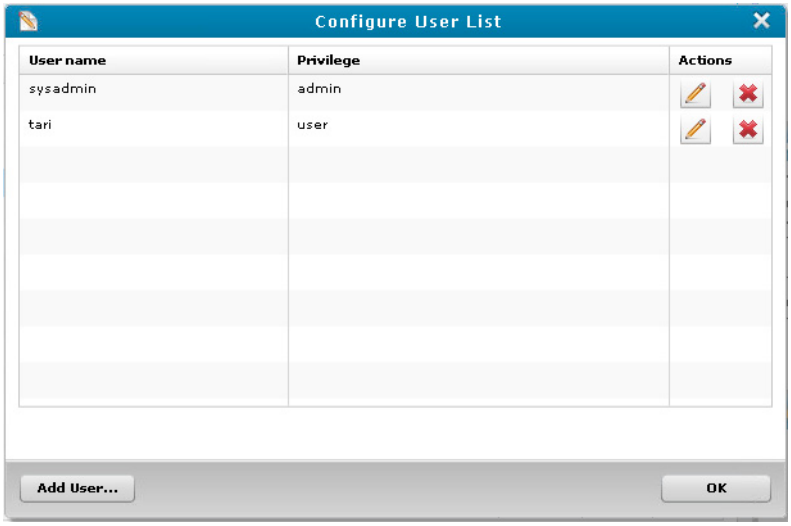
Figure 58 Accessing User Management



2 To add a new user, select **Add User**; or, to modify or delete an existing user, select that user's **Edit** (pencil) or **Delete** (**X**) icon in the **Actions** column (see Figure 59).

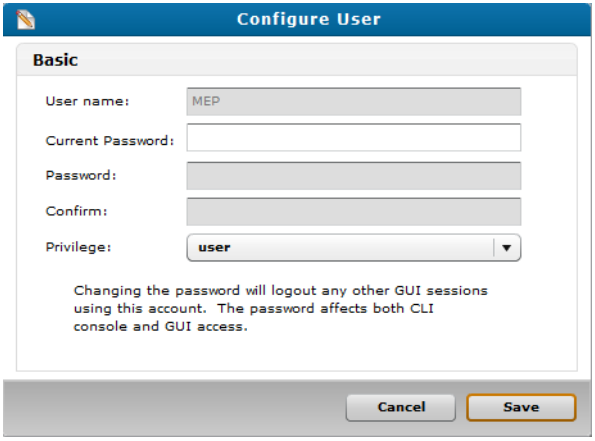
Note: You cannot delete user **sysadmin**, and you cannot change a username.

Figure 59 Configure User List



3 If you are editing or adding a user, fill in the **Configure User** dialog box, and then click **Save** (see Figure 60).

Figure 60 Configure User



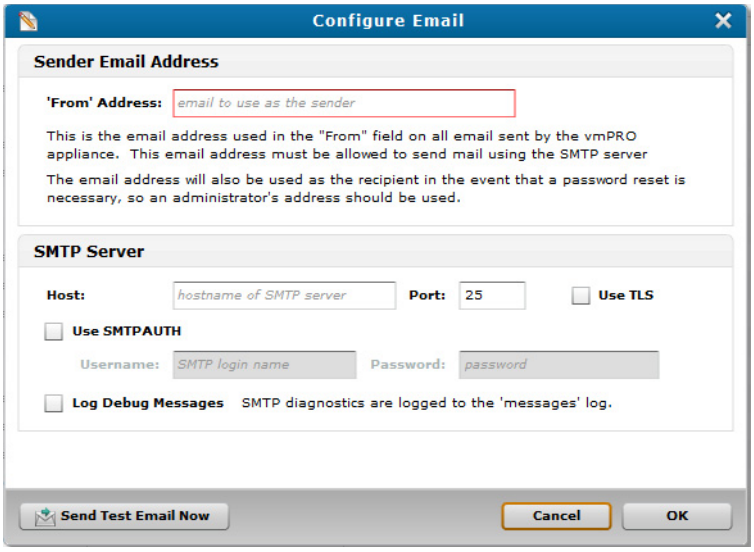
Emails, Reports, Alerts, and Autosupport

Quantum vmPRO's reports and alerts not only keep you informed; they also enable autosupport from the Quantum team, and enable you to view statistical analysis of your appliance's performance when you log into the Quantum support site.

To get these benefits, configure your appliance to email daily reports and alerts to you and copy the Quantum support team, and also to upload a daily report to the Quantum support site.

1. Make sure that your firewall allows access to **support.Quantum.com** on port 443.
2. Log into the Quantum vmPRO GUI; see Access Quantum vmPRO on page 25.
3. Check your email settings by selecting **Email** from the **Configure** drop-down list (see Figure 58).
   - The **'From' Address** field must contain the email address to be used for all email sent from the Quantum vmPRO appliance, and the **Host** and **Port** fields must contain correct information for your SMTP server (see Figure 61).
   - Select or clear **Use TLS.**
   - Select or clear **Use SMTPAUTH** (SMTP Auth is not required.) If you have selected **Use SMTPAUTH**, enter the **Username** and **Password**.
   - Select or clear **Log Debug Messages**.
   - If you select **Send Test Email Now**, you should receive a test email at the email address in the **'From' Address** field.
   - Select **OK** to save your changes.

Figure 61 Configure Email


Configure Email
Sender Email Address
'From' Address:
email to use as the sender
This is the email address used in the "From" field on all email sent by the vmPRO appliance. This email address must be allowed to send mail using the SMTP server
The email address will also be used as the recipient in the event that a password reset is necessary, so an administrator's address should be used.
SMTP Server
Host:
hostname of SMTP server
Port:
25
Use TLS
Use SMTPAUTH
Username:
SMTP login name
Password:
password
Log Debug Messages
SMTP diagnostics are logged to the 'messages' log.
Send Test Email Now
Cancel
OK

4 To configure reporting, select **Reports & Alerts** from the **Configure** drop-down list (see Figure 58).

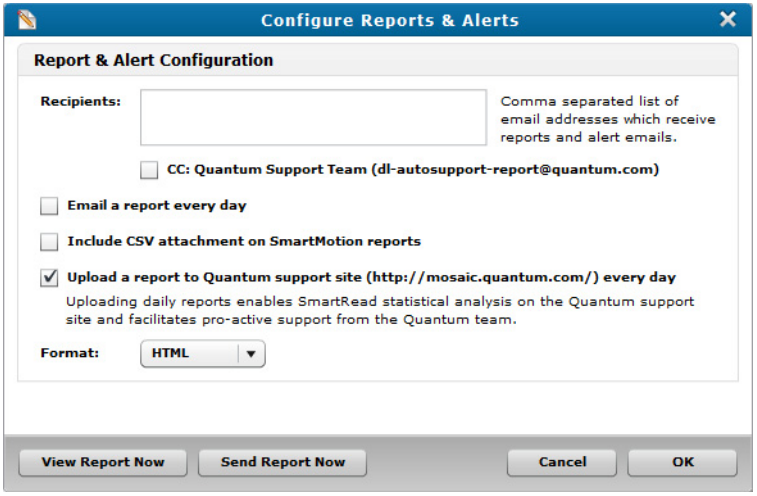
- Enter **Recipients** for email messages containing reports and alerts.
- Select or clear **CC: Quantum Support Team**.
- Select or clear **Email a report every day**.
- Select or clear **Include CSV attachment on SmartMotion reports**.
- Select or clear **Upload a report to Quantum support site every day.**

Note: Standard Edition customers can upload reports; however, they cannot access the support site. If you want to take full advantage of this feature, you must either purchase additional capacity or purchase a service contract. For more information, contact http://www.quantum.com.

- Select the email **Format**: HTML or **plain text**.

- Select **View Report Now** to see the report. For more information on the contents of the report, see View Report on page 20.
- Select **Send Report Now** to test your configuration. Within a few minutes, you should see your report on the support site at support.Quantum.com (check the **Appliances** tab of your **My Appliances** page).
- Select **OK** to save your changes (see Figure 62).

Figure 62 Configure Reports and Alerts


Configure Reports & Alerts
Report & Alert Configuration
Recipients:
Comma separated list of email addresses which receive reports and alert emails.
CC: Quantum Support Team (dl-autosupport-report@quantum.com)
Email a report every day
Include CSV attachment on SmartMotion reports
Upload a report to Quantum support site (http://mosaic.quantum.com/) every day
Uploading daily reports enables SmartRead statistical analysis on the Quantum support site and facilitates pro-active support from the Quantum team.
Format:
HTML
View Report Now
Send Report Now
Cancel
OK

Time and NTP

Quantum vmPRO can use NTP servers to control the internal clock.

Note: Use of an NTP server is highly recommended. Unpredictable errors can occur if the system date and time are not consistent within the VMware environment.

The time zone of the Quantum vmPRO Appliance must match the time zone of the vCenter or ESX server(s).

In a vCenter environment all hosts (including the vmPRO appliance), the vCenter server, and all ESX or ESXi hosts managed by the vCenter server must have their system time synchronized to the same NTP servers.

Note: Where time service is not available, all hosts must have their time manually set to the same time.

1 Log into the Quantum vmPRO GUI; see Access Quantum vmPRO on page 25.

2 From the Select **Configure** drop-down list, select **Config Wizard** to open the **Quantum vmPRO Configuration Wizard** (see Figure 58).

3 Select **Time & NTP** (see Figure 63).

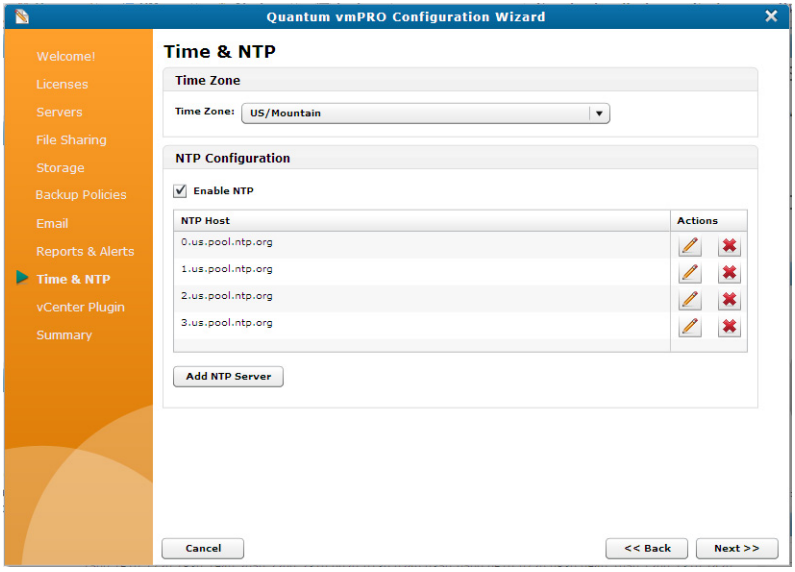


Figure 63 Configuration Wizard: Time & NTP

4 Make your additions and changes to your **Time Zone** and **NTP** settings.

5 Select **Summary** (or select **Next** until you get to the summary screen).

6 Select **Save**, then **Next**, then **Finish** to make your changes permanent.

Updating Quantum vmPRO Software

This section describes how you can check for software updates, configure when you are notified about available software updates, and how to install the updates.

- Check for Software Updates
- Configure When to Receive Software Update Notices
- Install Software Updates

Check for Software Updates

If you are using the check for updates automatically option, a **Software updates** bar appears in the GUI just above the main tab when updates are available (see Figure 64).

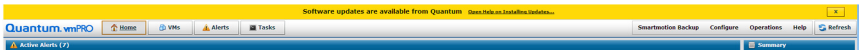


Figure 64 Software Updates Bar

To manually check for Quantum vmPRO updates, do the following:

1. From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Software updates** (see Figure 65). The **Configure Software Updates** dialog box displays.
2. To manually check for software updates, on the **Configure Software Updates** dialog box, select **Check now** (see Figure 66).

Figure 65 Accessing Software Updates

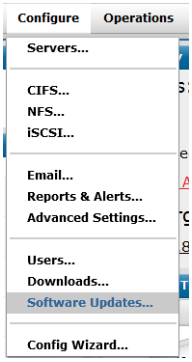
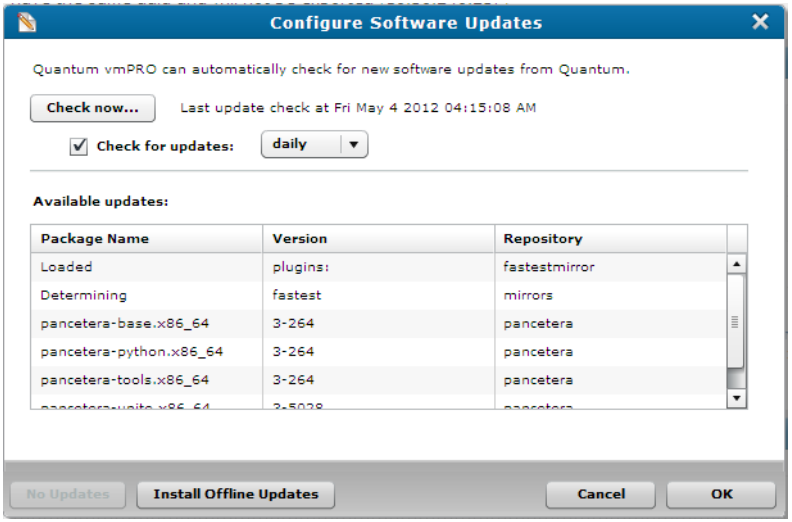


Figure 66 Configure Software Updates



Configure When to Receive Software Update Notices

To configure when you receive notifications regarding software updates, do the following:

1. From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Software updates** (see Figure 65). The **Configure Software Updates** dialog box displays.
2. To receive automatic notification for software updates, select **Check for updates**, and then select **daily** or **weekly**.
3. Select **OK**.

Install Software Updates

To install the available software updates, do the following:

1. From the **Configure** drop-down list in the Quantum vmPRO GUI, select **Software updates** (see Figure 65). The **Configure Software Updates** dialog box displays.
2. On the **Configure Software Updates** dialog box, select **Install Offline Updates** (see Figure 66)
3. When the updates have been installed, select **OK**.

Chapter 3

Back Up and Store Data With Quantum vmPRO

This chapter describes the use of the vmPRO tools and features that allow you to back up and store your data.

Back Up and Store Data

For more detailed and specific information regarding vSphere ESX host datastore and storage considerations, see the **vSphere ESX Host Notes and Best Practices** section of the Quantum vmPRO Best Practices Guide.

Caution: DXi V-Series appliances (such as DXi V1000 or DXi V4000) should not be backed up by the vmPRO. When a DXi V-Series appliance is managed by a vmPRO appliance, the DXi V-Series appliance should be disabled from being exported on the vmPRO. If you want to backup your DXi V-Series appliance, it should be replicated to another DXi appliance.

Note: If your backup target is powered down or in a disconnected state, your vmPRO GUI will time-out. If you see messages or behavior to this effect, check the status of your backup target, and then proceed when the backup target it functioning normally.

Using Your Current Backup and Recovery Solution

With Quantum vmPRO, you can use your current backup and recovery solution. If you need assistance, consult the product-specific technical notes on the Quantum Support site. Refer to the online support article: Quantum vmPRO and Your Backup Solution

Using Folders to Facilitate Multiple Backup Policies

You can set up folders within your Quantum vmPRO file system to facilitate multiple backup policies on a single appliance; see Create and Manage Folders on page 145. You may want to use folders in conjunction with the group management feature for better load balancing; see Set Up and Manage Groups on page 135.

Using SmartMotion Backup

Quantum's **SmartMotion Backup** feature allows the Quantum vmPRO appliance to push data from **/export** to external storage on a scheduled basis and recover it easily.

Each vmPRO appliance can have multiple backup policies and each policy will have its own schedule; however, a specific policy can be run only once per day. Also, if you are executing backup policies in a group configuration, only two individual backup policies can run at a time on the master and on each node.

Note: Using vmPRO's **Advance Settings**, you can configure your vmPRO to disallow backups when there is not enough datastore space for the snapshot (see Disallow backups when there is not enough datastore space for snapshot on page 169).

At a minimum, a SmartMotion backup will include the following:

Add Servers

To add, edit, or delete servers, see Accessing the Servers on page 42.

Discover the VMs

A discovery is usually done automatically. To manually discover your VMS, see Discover Now on page 20.

Select the VMs to be exported

For ESX servers, go to the VMs tab and select the VMs you want to export. For more information, see Selecting VMs for Export on page 90.

For a vCenter, you can use the same method as describe for the ESX servers, or you can access the **Configuration Wizard** for servers. Using the wizard, you can edit the vCenter's export configuration and select the entire vCenter (not recommended), or select the appropriate subsets. This information will be reflected in the backup policy for the vCenter. For more information, see Add a vCenter Server on page 51.

At this point, you might consider the following:

- The use of folders to tailor your selection of VMs based on whatever backup goal you want to accomplish, such as a backup based on VM types or geographic locations, see Create and Manage Folders on page 145.
- The use of Change Block Tracking (for greater efficiency) see vSphere Changed Block Tracking (CBT) Support on page 161).

  Note: Setting, or re-setting, the CBT schedule sets the time at which the next full backup will occur.

- For Windows based VMs, the use and configuration of Volume Shadow Copy Services (VSS), see Quantum VSS Writer on page 149.

Set up storage

To add, delete, and edit storage, see Using Additional Storage on page 76.

Create a backup policy

A backup policy can include the following:

- Assigning folders.

- Assigning storage.
- Setting up the backup's schedule.
- Setting up the backup's retention period.

For the options associated with backup policies, see Using Backup Policies on page 79.

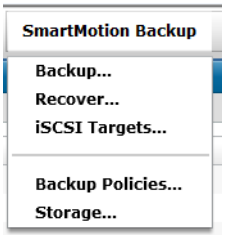
Run SmartMotion.

Running a SmartMotion Backup

To begin a SmartMotion backup session do the following:

1 Select **Backup** from the **SmartMotion Backup** drop-down list (see Figure 67).

Figure 67 Selecting the SmartMotion Backup Options

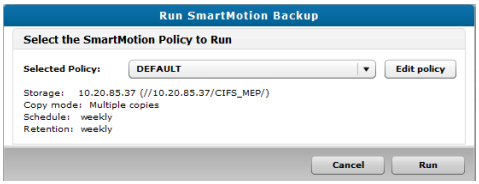


2 From the **Run SmartMotion Backup** dialog box (see Figure 68), select the appropriate backup policy, and select **Run**. If necessary, you can edit the policy before starting the backup. This will be necessary if you have not selected a storage location for your backup policy or you have not configured your folder so that it is assigned to the appropriate backup policy; see Step 3 on page 82 of Create a new Backup Policy.

You can view the progress for your backup by selecting the **Backup** tab on the **Task** screen (see Figure 69).

The **Recent SmartMotion Backup** pane of the **Backup** screen displays a listing of **Running** backups and a listing of the policies that have been implemented (under **Policy History**).

Figure 68 Selecting the Backup Policy



When the SmartMotion backup has completed, you can view the list of **VMs**, **Folders**, **Nodes,** and **Errors** (displays only when errors are detected).

1. From the vmPRO GUI, select the **Tasks** tab.
2. From the **Tasks** screen, select the **Backup** tab.
3. From the **Backup** screen, make the appropriate selection: **VMs**, **Folders**, or **Nodes** (see Figure 70).

Figure 69 Backup Progress

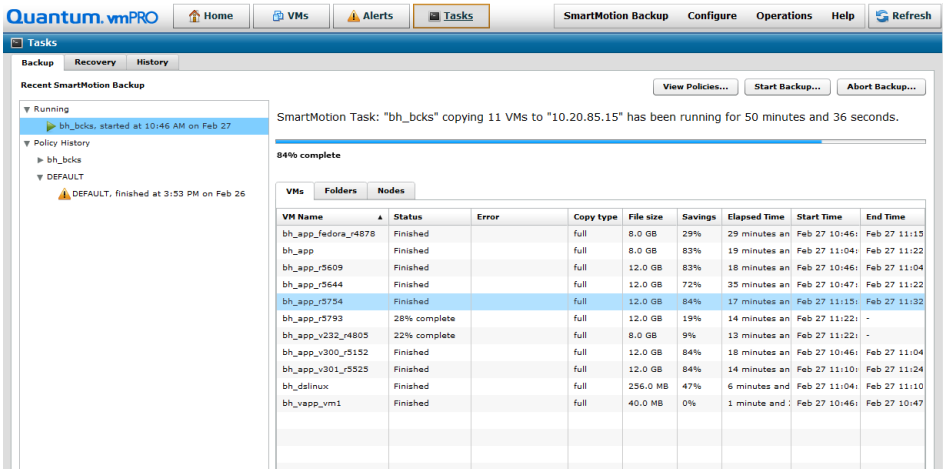
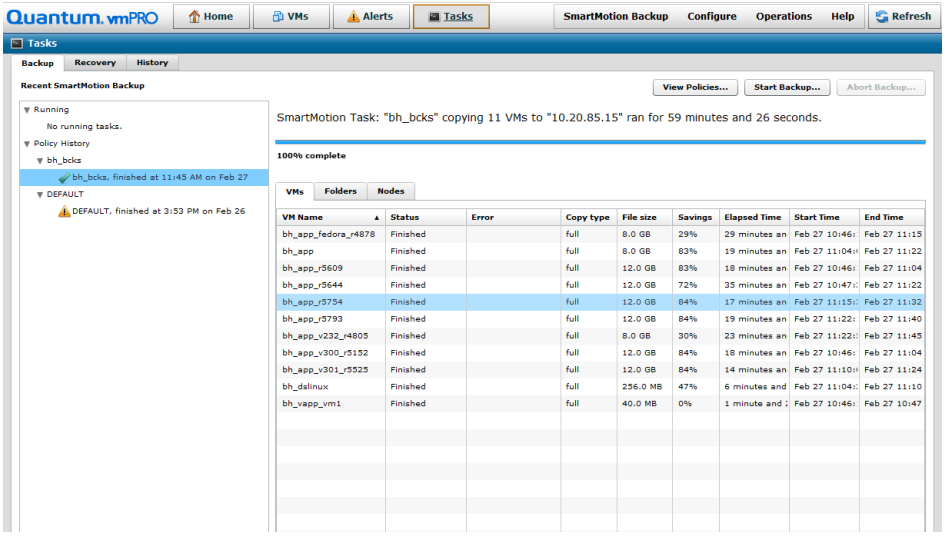

Quantum vmPRO
Home
VMs
Alerts
Tasks
SmartMotion Backup
Configure
Operations
Help
Refresh
Tasks
Backup
Recovery
History
Recent SmartMotion Backup
View Policies...
Start Backup...
Abort Backup...
Running
bh_bcks, started at 10:46 AM on Feb 27
Policy History
bh_bcks
DEFAULT
DEFAULT, finished at 3:53 PM on Feb 26
SmartMotion Task: "bh_bcks" copying 11 VMs to "10.20.85.15" has been running for 50 minutes and 36 seconds.
84% complete
VMs
Folders
Nodes
VM Name
Status
Error
Copy type
File size
Savings
Elapsed Time
Start Time
End Time
bh_app_fedora_r4878 Finished full 8.0 GB 29% 29 minutes an Feb 27 10:46: Feb 27 11:15
bh_app Finished full 8.0 GB 83% 19 minutes an Feb 27 11:04: Feb 27 11:22
bh_app_r5609 Finished full 12.0 GB 83% 18 minutes an Feb 27 10:46: Feb 27 11:04
bh_app_r5644 Finished full 12.0 GB 72% 35 minutes an Feb 27 10:47: Feb 27 11:22
bh_app_r5754 Finished full 12.0 GB 84% 17 minutes an Feb 27 11:15: Feb 27 11:32
bh_app_r5793 28% complete full 12.0 GB 19% 14 minutes an Feb 27 11:22: -
bh_app_v232_r4805 22% complete full 8.0 GB 9% 13 minutes an Feb 27 11:22: -
bh_app_v300_r5152 Finished full 12.0 GB 84% 18 minutes an Feb 27 10:46: Feb 27 11:04
bh_app_v301_r5525 Finished full 12.0 GB 84% 14 minutes an Feb 27 11:10: Feb 27 11:24
bh_dslinux Finished full 256.0 MB 47% 6 minutes and Feb 27 11:04: Feb 27 11:10
bh_vapp_vm1 Finished full 40.0 MB 0% 1 minute and Feb 27 10:46: Feb 27 10:47

Figure 70 Viewing Backed up VMs


Quantum. vmPRO
Home
VMs
Alerts
Tasks
SmartMotion Backup
Configure
Operations
Help
Refresh
Tasks
Backup
Recovery
History
Recent SmartMotion Backup
View Policies...
Start Backup...
Abort Backup...
Running
No running tasks.
Policy History
bh_bcks
bh_bcks, finished at 11:45 AM on Feb 27
DEFAULT
DEFAULT, finished at 3:53 PM on Feb 26
SmartMotion Task: "bh_bcks" copying 11 VMs to "10.20.85.15" ran for 59 minutes and 26 seconds.
100% complete
VMs
Folders
Nodes
VM Name
Status
Error
Copy type
File size
Savings
Elapsed Time
Start Time
End Time
bh_app_fedora_r4878 Finished full 8.0 GB 29% 29 minutes an Feb 27 10:46: Feb 27 11:15
bh_app Finished full 8.0 GB 83% 19 minutes an Feb 27 11:04:! Feb 27 11:22
bh_app_r5609 Finished full 12.0 GB 83% 18 minutes an Feb 27 10:46: Feb 27 11:04
bh_app_r5644 Finished full 12.0 GB 72% 35 minutes an Feb 27 10:47: Feb 27 11:22
bh_app_r5754 Finished full 12.0 GB 84% 17 minutes an Feb 27 11:15: Feb 27 11:32
bh_app_r5793 Finished full 12.0 GB 84% 19 minutes an Feb 27 11:22: Feb 27 11:40
bh_app_v232_r4805 Finished full 8.0 GB 30% 23 minutes an Feb 27 11:22:! Feb 27 11:45
bh_app_v300_r5152 Finished full 12.0 GB 84% 18 minutes an Feb 27 10:46: Feb 27 11:04
bh_app_v301_r5525 Finished full 12.0 GB 84% 14 minutes an Feb 27 11:10:! Feb 27 11:24
bh_dslinux Finished full 256.0 MB 47% 6 minutes and Feb 27 11:04: Feb 27 11:10
bh_vapp_vm1 Finished full 40.0 MB 0% 1 minute and : Feb 27 10:46: Feb 27 10:47

To stop a SmartMotion backup, do the following:

1 From the vmPRO GUI, select the **Tasks** tab.

2 From the **Tasks** screen, select the **Backup** tab.

3 Select the backup that you want to stop.

4 Select **Abort Backup**.

Using Additional Storage

In order to perform SmartMotion backups, you will need to add, edit (configure), and delete storage locations.

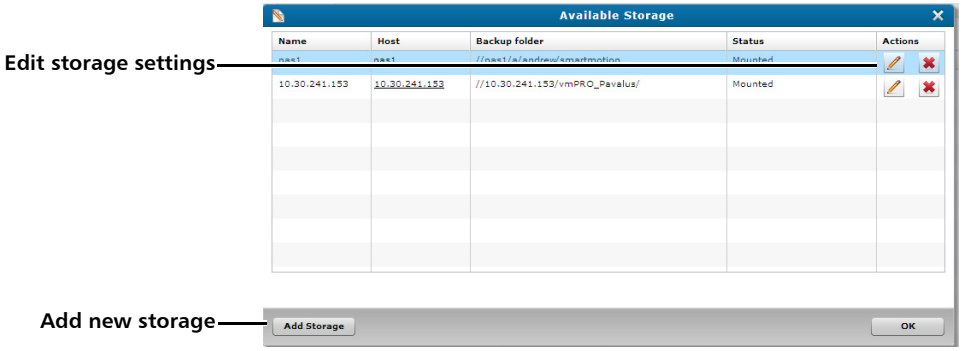
1 From the **SmartMotion Backup** drop-down list, select **Storage** (see Figure 67). The **Available Storage** dialog box displays.

2 From the **Available Storage** dialog box (see Figure 71), you can add new storage, edit the configuration of existing storage, or delete existing storage.

- To edit the configuration settings of existing storage, select the entry, and then select the pencil icon.
- To add new storage, select **Add Storage**.

- To delete a storage location, select the entry, and then select the red X.

Figure 71 Available Storage



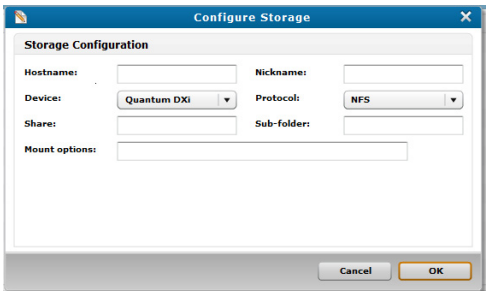
3 From **Configure Storage** dialog box, enter or modify the following settings (see Figure 72):

- **Hostname** (or IP address)

  Take care when entering your hostname. Some devices will allow you to enter a name for a nonexistent device. If this happens, simply edit the entry and correct the error.

- **Nickname**
- **Device**
- **Protocol**
- **Share**
- **Sub-folder**
- **Mount options**
- **CIFS User** (Protocol > CIFS)
- **CIFS Password** (Protocol > CIFS)
- **Fastcopy user** (Device >Data Domain) with **Show SSH Key** Fastcopy requires an SSH key to be copied to the Data Domain appliance.

Figure 72 Configure Storage



4 Select **OK**.

Access a DXi for Additional Storage

DXis provide a backup solution that integrates deduplication and replication to connect backup and disaster recovery protection across distributed environments.

Before you can access a DXi for additional storage, it must be configured with either CIFS or NFS shares that your vmPRO can access. To accomplish this task, see any *Quantum DXi User's Guide*, or contact the system administrator for the DXi.

When the shares on the DXi have be successfully added, you will see how many DXis are available under the text heading, **DXi Target:** in the **Summary** pane on the vmPRO's **Home** page.

If only one DXi is available, you will see **DXi Target:** `hostname` (see Figure 73), where `hostname` is the value entered in the **Hostname** text box when the DXi was added for additional storage and is a link to the native management interface for the DXi. If more than one DXi has been added, you will see **DXi Targets:** `X Configured DXi` (see Figure 74), where X is the number of DXis that have been added for storage and is a link that displays the **Available Storage** dialog box.

When the CIFS or NFS shares have been configured on the DXi, you can then use the **Add Storage** function on the **Available Storage** dialog box to add the DXi as a source for additional storage.

To designate a DXi for additional storage, select **Quantum DXi** as the **Device** in Step 3 of Using Additional Storage.

Note: If you are using the CIFS **Protocol**, be sure to enter the **CIFS User** name and **CIFS Password** exactly as enter in the DXi's NAS configuration settings.

Figure 73 One DXi Configured for Additional Storage

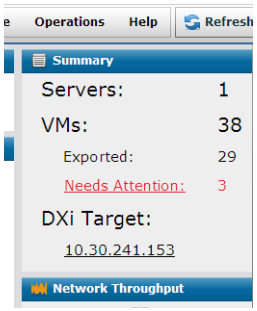
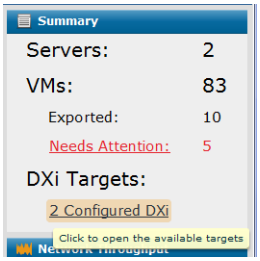


Figure 74 More than one DXi Configured for Additional Storage



Using Backup Policies

Before creating a backup policy, there are several items you can consider before actually creating the policy, such as determining a backup schedule and retention period, creating folders and assigning the appropriate VMs to those folders, and deciding if you want to manage multiple vmPROs using the group option. Also, keep in mind that while VMs can belong to only one folder, that folder can be backed up by more than one policy, which in turn allows it to have multiple schedules.

Backup policies are unique to (all policy parameters controlled by) the vmPRO that created them regardless of storage. For example, if two vmPROs use the same storage, the backups created by vmPRO A will run and be retained by the backup policies' schedule and retention parameters set by vmPRO A. No backup policies set by vmPRO B will affect those of vmPRO A and vice versa.

The **Available Backup Policies** dialog box allows you add, edit (configure), designate a backup policy to be the default backup policy, and delete backup policies.

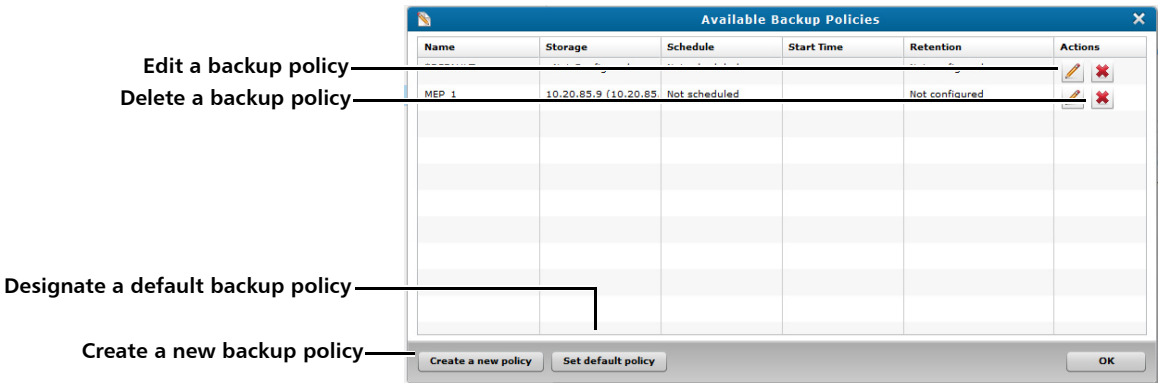
To access the **Available Backup Policies** dialog box (see Figure 75), select **Backup Policies** from the **SmartMotion Backup** drop-down list (optionally, select **Tasks > Backup > View Policies**) (see Figure 67).

Use the **Available Backup Policies** dialog box to perform the following tasks:

- Create a new Backup Policy
- Modify an Existing Backup Policy
- Designate a Backup Policy as the Default Backup Policy
- Delete a Backup Policy

Note: Creating multiple backup policies provides the ability to have multiple backup schedules, backup to multiple targets, and supports multiple retention (date at which backups are deleted) policies.

Figure 75 Available Backup Policies



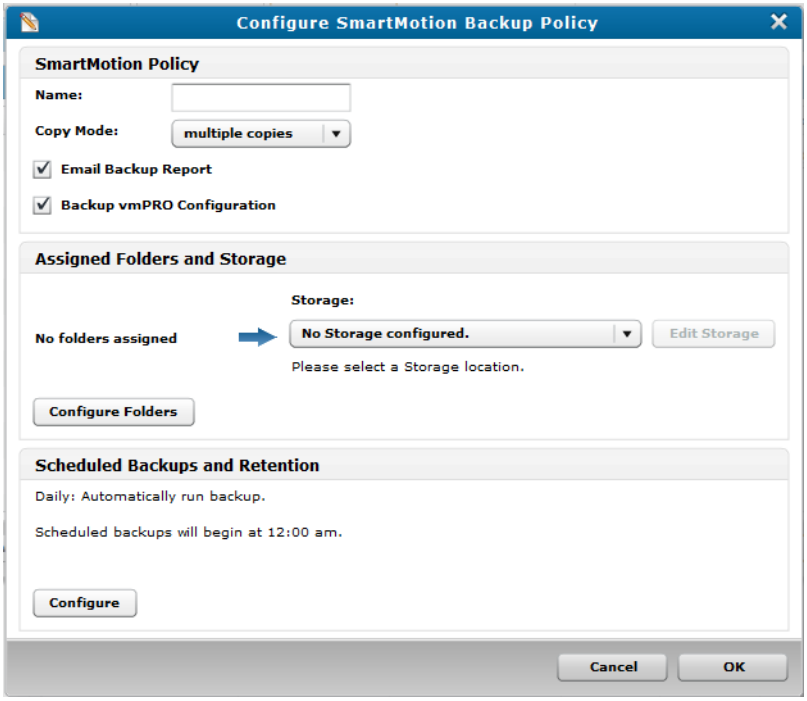
Create a new Backup Policy

To create a new backup policy, you will be configuring the following:

- SmartMotion Policy
- Assign Folders and Storage
- Schedule Backups and Retention

1 From the **Available Backup Policies** dialog box, select **Create a new policy**. The **Configure SmartMotion Backup Policy** dialog box displays (see Figure 76).

Figure 76 Configure SmartMotion Backup Policy - Add



2 Under **SmartMotion Policy**, enter or modify the following settings:

- **Name**
- **Copy Mode** - select **multiple copies** or **one copy**

  The **one copy** mode saves just one version of a VM, while the **multiple copies** saves more than one. The latter allows for retention to be applied across the multiple versions.
- Select or clear **Email Backup Report**
- Select or clear **Backup vmPRO Configuration**

  This option allows you to backup (save off-site) an encrypted copy of the vmPRO's current configuration file. The file contains all the configuration data that is needed to restore the appliance onto a new or re-installed appliance.

This configuration file is named **db-package.tar.bz2.enc**, and it is written to the base directory of the target storage for that particular backup. Its base directory follows the SmartMotion directory hierarchy convention of **<Storage Sub-folder>\<YYYY_MM>\<YYYY_MM_DD_HHMMSS>**.

This file will then be used by the configuration import function: **Operations > Import vmPRO Configuration** to complete the recovery. When importing the vmPRO configuration, you will be asked to browse your computer for the configuration package, so the computer running the vmPRO GUI must have access to the configuration file.

3 Under **Assigned Folder and Storage**, perform the following tasks:

a Select the storage destination from the **Storage** drop-down list.

If necessary, select **Create new Storage** from the **Storage** drop-down list or select **Edit Storage** to modify the storage configuration; see Using Additional Storage on page 76.

b Select **Configure Folders**. The **Configure Folder Assignments** dialog box displays (see Figure 77).

If necessary, select **Create Folder** to create a new folder; see Step 4 on page 146 of Create and Manage Folders. To access the **Changed Block Tracking Schedule** option for the backup policy, see Schedule Your Changed Block Tracking Resets on page 164.

i To assign a folder to the backup policy, perform the following:

a Select the folder in the **Available folders (not assigned to this policy)** list.

b Select **Move Up**.

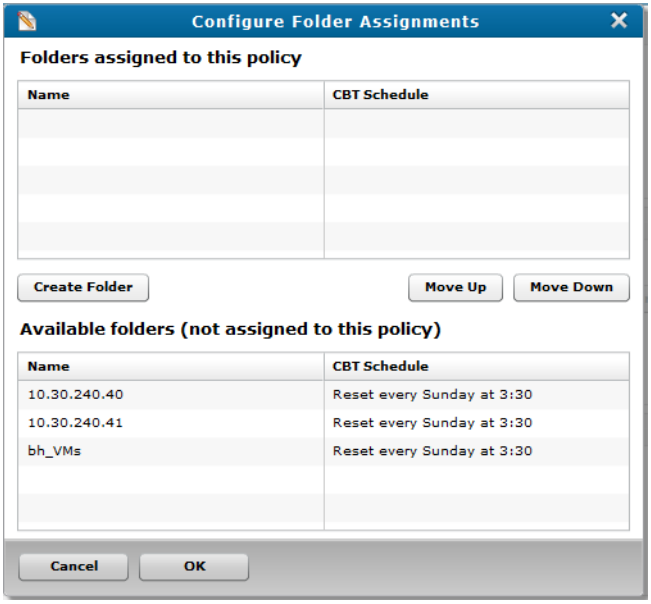
ii To remove a folder from the backup policy, perform the following:

a Select the folder in the **Folders assigned to this policy** list.

b Select **Move Down**.

c When you have completed configuring your folder and storage assignments, select **OK**.

Figure 77 Configure Folder Assignments



4 Under **Scheduled Backups and Retention**, select **Configure**, the **Configure Backup Schedules and Retention** dialog box displays (see Figure 78).

Any combination of time intervals can be enabled, that is to say you can configure backup and retention parameters for **Weekly, Monthly,** and **Annual** time intervals.

The actual backup activity is performed based on the smallest/shortest time interval (The longer time interval backups would not take place because they would be covered by the shorter interval.) All retention periods are honored. Ex: Daily backups are run, and both the daily and weekly retention policies are applied. Assume the daily retention is set for 8 days, and the weekly retention is set for 5 weeks with **Sundays** selected as the **Retain VM from** value. Daily backups would run and the two retention policies would cause backups to be deleted after 8 days, except for 5 weeks of Sunday backups.

Note: When a manual SmartMotion policy backup is run, it is treated like a daily backup for retention purposes. For example: A manual backup performed on a day when the daily backup option is disabled and the day does not fall into a weekly, monthly, or yearly schedule, the backup is saved as a daily backup.

a Set the time at which you want the backup to start. Select **Automatically start scheduled SmartMotion backup at**, and then select the hours and minutes from the **Time** drop-down lists.

b Select the tab of the time interval for which you want to schedule the backup to run: **Daily**, **Weekly**, **Monthly**, or **Annual.**

c Select the **Enable the <time interval> backup schedule** option. This selection activates your retention options. Each interval has its own set of parameters.

Note: Setting any retention period to zero, "**0**", will keep the backups indefinitely.

- **Daily** — runs the backup each day (see Figure 78)

  Retain VMs for X **days** — Enter the number of days that you want to keep the backup.

- **Weekly —** runs the backup on a weekly basis based on the selected mode (see Figure 79)

  Basic Mode > **Retain VMs from** — Select a day of the week to run your backup.

  Advanced Mode > **Retain VMs from the following days:** Select which days of the week to run the backup.

  Retain VMs for X **weeks** — Enter the number of weeks that you want to keep the backup.

- **Monthly —** runs the backup on a monthly basis (see Figure 80)

  Retain VMs from — Select the appropriate time period to run the backup and begin its retention period: **Specific day** (and the select the day from **1st of the month** through

XX **last of the month**), **The first backup for the month**, or **The last backup of the month**.

Retain VMs for X **months** — Enter the number of months that you want to keep the backup.

- **Annual** — runs the backup on an annual basis (see Figure 81)

  Retain VMs from — Select the appropriate time period to run the backup and begin its retention period: **Specific date** (and select the specific month and day), **The first backup of the year**, or **The last backup of the year**.

  Retain VMs for X **years** — Enter the number of years that you want to keep the backup.

d When you have completed configuring your backup schedule and retention period, select **OK**.

* The following might help you determine a retention policy:

Determining how many backups to keep and for how long, is based on a number of factors. The number of backups that can be retained is highly dependent on the characteristics of the target NAS storage device. The rate of storage utilization is dependent on a number of factors such as deduplication and the rate of unique block creation in the VMs that are being backed up. In general, it is best to start with a lower number of backups retained until the capacity growth rate can be observed, for example between 7 to 14 days.

Use the following to help you determine your retention policy:

- Deduplication-Enabled Target - DXi and other deduplicating NAS targets will generally achieve 10:1 to 20:1 reduction in aggregate backup volume, enabling greater retention periods than with comparably sized non-deduplicating storage devices. Full and Differential/CBT backups will have approximately the same storage utilization impact on targets that perform deduplication.
- Non-Deduplicating Target - Non-deduplicating NAS targets will consume disk more rapidly. Here full and Differential/CBT backups will have different impacts, with the CBTs generally being approximately 15% to 30% the size of a full backup depending on your environment.

- Regardless of the type of storage target in use, the biggest factor affecting the rate of storage utilization is the rate at which unique data blocks are generated by the VM that are being backed up.

5 When all configuration items have been addressed, select **OK**.

Figure 78 Retention - Daily

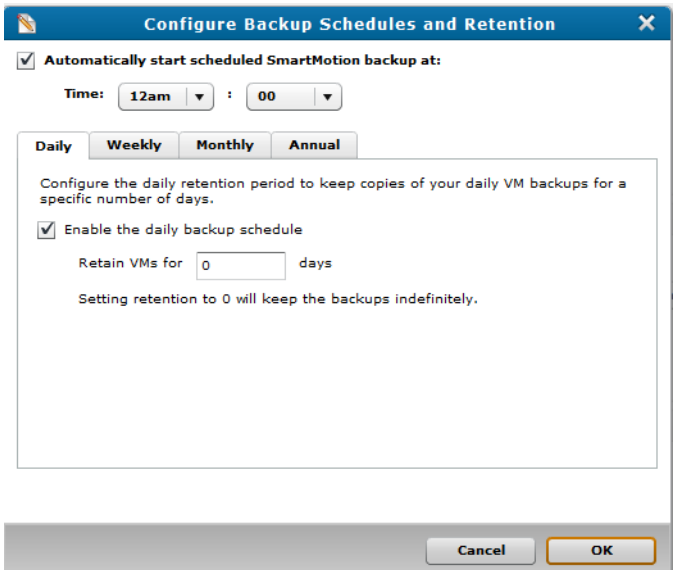


Figure 79 Retention - Weekly

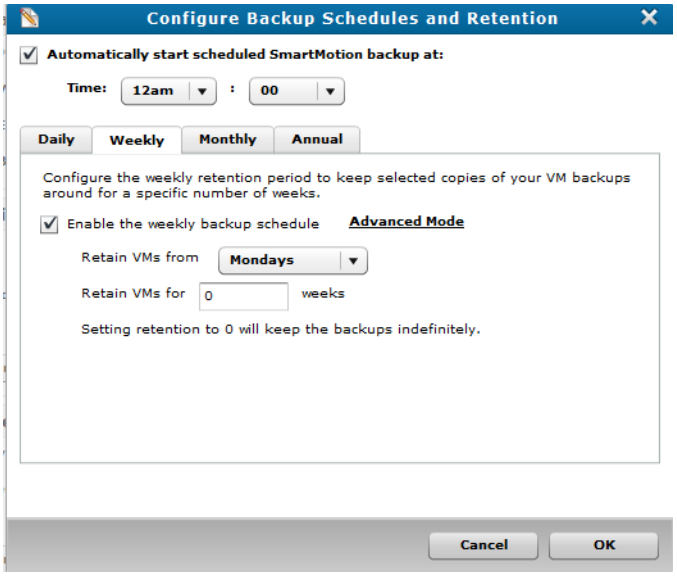


Figure 80 Retention - Monthly

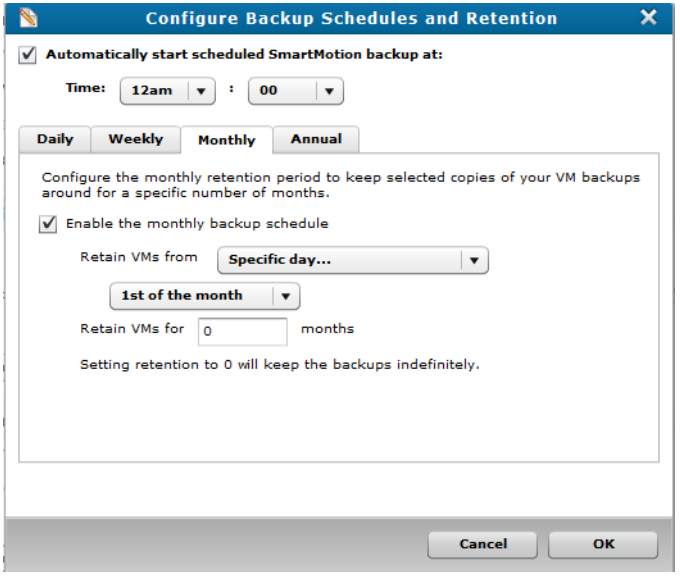
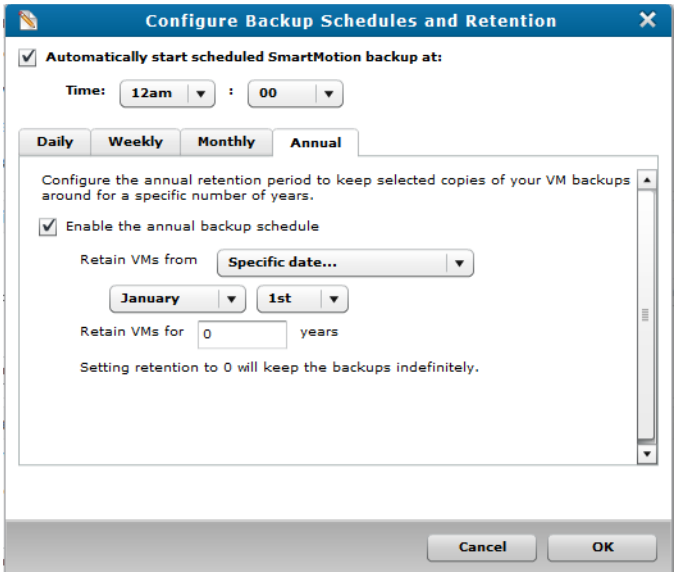


Figure 81 Retention - Annual



Modify an Existing Backup Policy

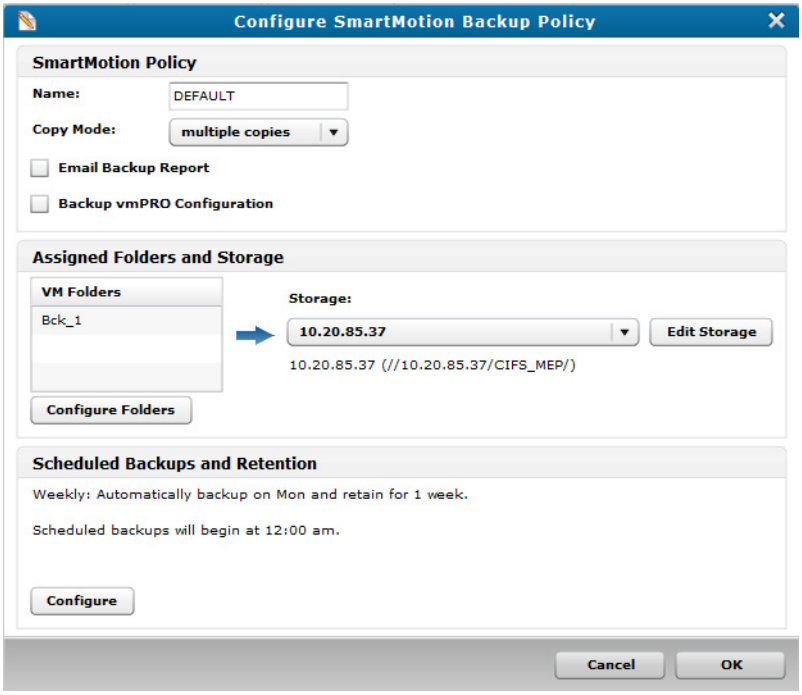
To modify an existing backup policy, make the appropriate changes to the configuration settings that you used to create the backup policy.

1 From the **Available Backup Policies** dialog box, select the pencil icon. The **Configure SmartMotion Backup Policy** dialog box displays (see Figure 82). The only difference between the **Configure SmartMotion Backup Policy** dialog box to modify a backup policy and to create a backup policy is a table that shows VM folder assignments for the existing backup policy. Refer to the procedure to create a new backup policy where necessary.

Note: If the **Copy Mode** for your backup policy is set to **one copy**, the **Retention Policy** option will not be active. A **Copy Mode** of **one copy** does not require any retention policy because there is only one backup copy; therefore, there is nothing for a policy to remove. Select **multiple copies** if you want to create a retention policy.

2 When you have made all your modifications, select **OK.**

Figure 82 Configure SmartMotion Backup Policy - Modify



Designate a Backup Policy as the Default Backup Policy

To designate a backup policy to be your default backup policy, perform the following tasks:

1. From the **Available Backup Policies** dialog box, select the policy that you want to use as your default policy.
2. Select **Set default policy**.
3. Select **OK.**

Delete a Backup Policy

To delete a backup policy, perform the following tasks:

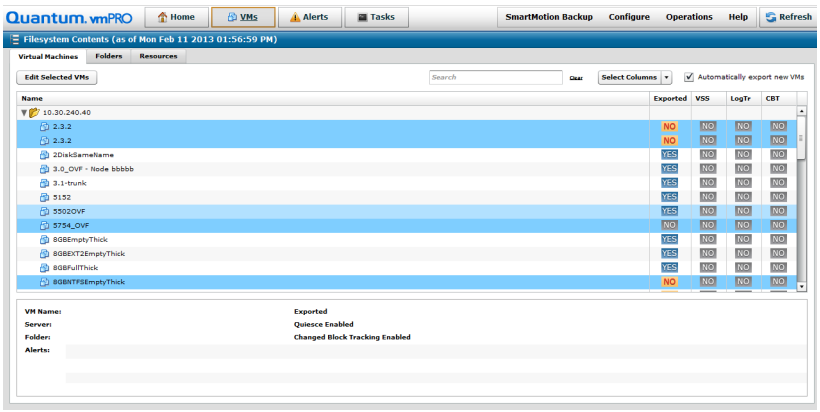
1. From the **Available Backup Policies** dialog box, select the policy that you want to delete.
2. Select the red X.
3. Select **OK.**

Selecting VMs for Export

To select VMs for export (enable or make available for backup), do the following:

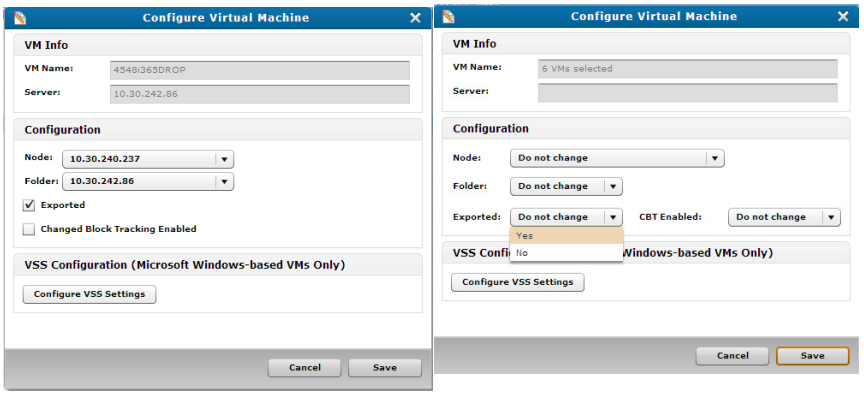
1. From the Quantum vmPRO GUI, select **VMs**.
2. On the **VMs** screen, select the **Virtual Machines** tab.
3. From the VMs table, select the VMs that you want to export. You may need to open a folder (by selecting it) to access the VMs (see Figure 83).
   - To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
   - To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you want to select.
   - If you want to backup all the VMs in a folder, select the folder.
4. Select **Edit Selected VMs** above the VM list.

Figure 83 Selecting VMs to Export



5. In the **Configure Virtual Machine** dialog box, select **Exported** if you have selected only one VM, or select **Yes** on the **Exported** drop-down list if you have selected multiple VMs (see Figure 84).

Figure 84 Configure Virtual Machine



6 Select **Save**.

Chapter 4

Recover Data With Quantum vmPRO

This chapter describes the use of the vmPRO tools and features that allow you to recover your data.

Recover Data

Before starting a recovery, verify that you have enough free space on target datastores. The appliance will not warn you that there is not enough space available before executing a batch operation.

Note: After recovering a VSS enabled VM with Active Directory installed, the VM will be automatically rebooted twice during the VSS restore process. These reboots can take several minutes. During this time, you should not attempt to use the VM.

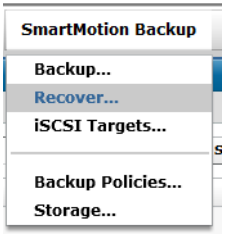
For the fastest access to file level recovery, configure the **Mount options** setting on the appliance to point directly to the location of the SmartMotion backups; (see Step 3 on page 77 of Using Additional Storage**).** This setting is preserved through reboots of the appliance and provides file level access to the backups at the **\\<vmPRO-Host_IP>\recover\files** CIFS share.

vmPRO Recover Virtual Machines Wizard

Using the vmPRO **Recover Virtual Machines Wizard**, you can recover VMs backed up by SmartMotion or manually recover a VM backed up using a third-party application.

To access the vmPRO **Recover Virtual Machines Wizard**, select **Recover** from the **SmartMotion Backup** drop-down list (see Figure 85). The **Recover Virtual Machines Wizard** dialog box displays, (see Figure 86).

Figure 85 Accessing the Recovery Wizard

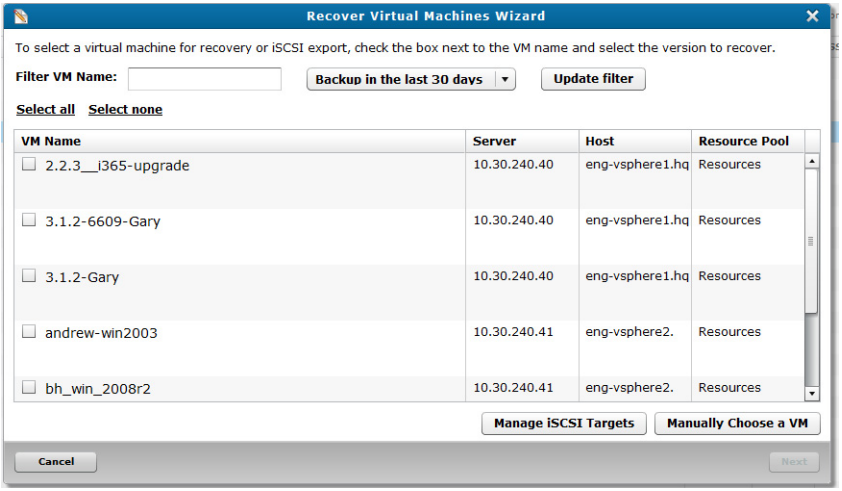


Recover VMs Backed up using SmartMotion

1 Access the **Recover Virtual Machines Wizard** dialog box.

2 From the **Recover Virtual Machines Wizard**, use the wizard's options to select the VMs you want to recover (see Figure 86).

Figure 86 Recover Virtual Machines Wizard



a Use the filter option to refine the list of VMs to recover.

i Enter any part of the VM's name in **Filter VM Name**.

ii Make the appropriate selection from the **Backup in last XX days** drop-down list.

iii Select **Update filter** to display the VMs.

b Select the VMs you want to recover.

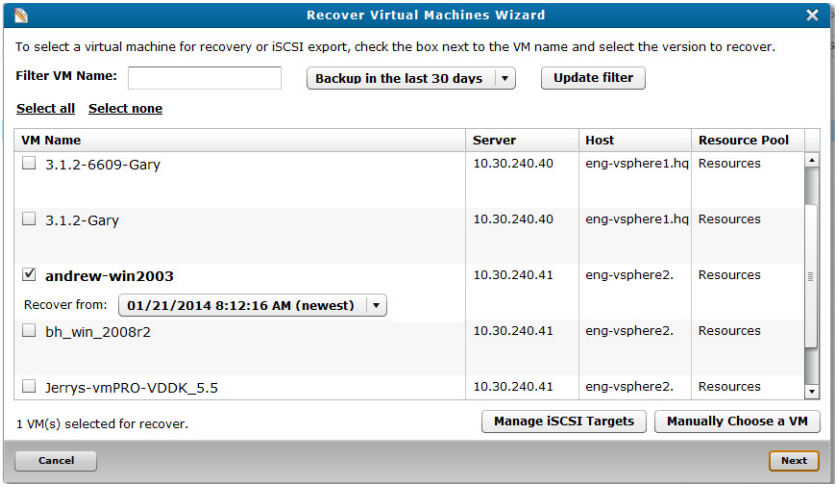
Note: At anytime you can select **Select none** to clear all previous selections.

i To select all VMs, select **Select all** to recover all VMs.

ii To select specific VMs, select the check boxes next to the VMs you want to recover.

iii For each VM you select, select the appropriate entry from the VM's **Recover from** drop-down list (see Figure 87).

Figure 87 Select Recover from

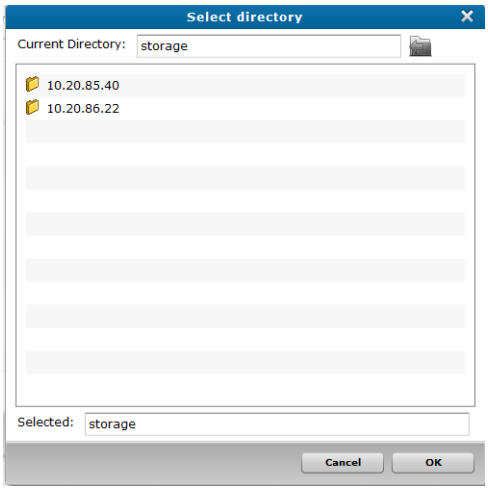


c (optional) At this point, most SmartMotion users will proceed to Step 3 on page 97. You can use the **Manually Choose a VM** option to recover a VM backed up using SmartMotion; however, it is mainly intended for recovering VMs that have been backed up using a third-party backup applications.

i Select **Manually Choose a VM**. The **Select Directory** (storage view) dialog box displays.

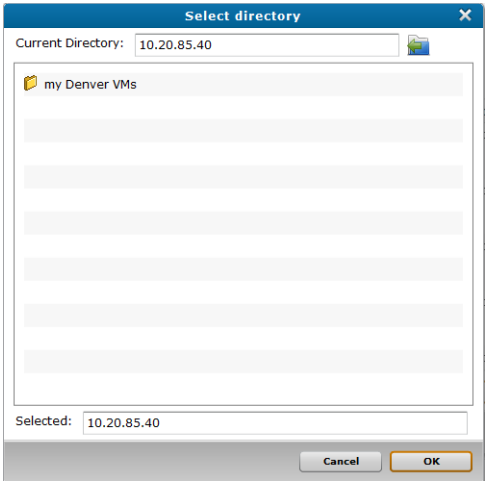
ii Double click the appropriate storage (Figure 88), the **Select Directory** (folder view) dialog box displays.

Figure 88 Select Directory-storage view



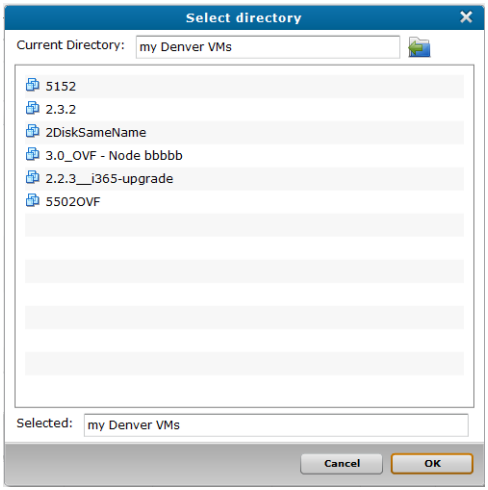
iii Double click the appropriate folder (see Figure 89), the **Select Directory** (VMs view) dialog box displays. If there are more levels of folders, continue to drill down until you reach the VMs.

Figure 89 Select Directory-folder view



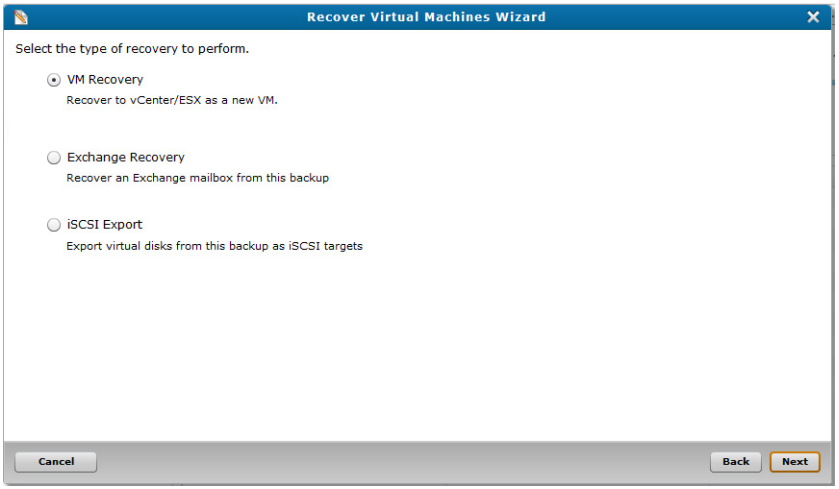
iv Select the VM you want to recover (see Figure 90), and then select **OK**.

Figure 90 Select Directory-VMs view



3 When you have selected all the VMs (and their appropriate **Recover from** entry), select **Next**. The **Recover Virtual Machines Wizard** dialog box displays (see Figure 91).

Figure 91 Recover Virtual Machines Wizard Recovery Type



4 On the **Recover Virtual Machines Wizard**, select the type of recovery that you want to initiate:

- VM Recovery—This option allows you to recover the VMs as new VMs to an ESX or vCenter.
- Exchange Recovery on page 103—This option allows you to recover mailboxes on an Exchange server.
- iSCSI Export on page 123—This option allows you to export the virtual disk as an iSCSI target and access it as a locally mounted disk.

Note: Only one VM at a time can be recovered when using this option.

Click **Next**.

VM Recovery

1. If you have selected more than one VM to recover, the **Recover Virtual Machines Wizard** (Select a policy for recovering your virtual machines.) dialog box displays. Proceed to step Step 3.
2. If you have selected only one VM to recover, the **Recover Virtual Machines Wizard** (Select the target virtual machine configuration) dialog box displays (see Figure 92).
   a. On the **Recover Virtual Machines Wizard** (Select the target virtual machine configuration) dialog box, make the appropriate selections.
      - Select **rename** for the **Action on conflict** option to avoid any interruptions during the restore due to VM name conflicts on the datastore.

        The rename option will register the VM with the VM name and append the next one-up number enclosed in parenthesize. Example: `<VM_name> (1)`, if `<VM_name> (1)` exists, it will be named `<VM_name> (2)`, etc. The rename option also renames the directory in which you are importing the VM using the same convention.
      - Select **Add the VM to vSphere/ESX inventory after restore?** to automatically add the VM to the vSphere client.
      - If the VM came from a vCenter or ESX server on the vmPRO, selecting **Register with the configuration from the**

backup? will return the VM to the same location from which it was backed up.

- If the VM did not come from a vCenter or ESX server, or you want to restore it to a different location on the server, clear **Register with the configuration from the backup?**. This will let you choose where the VM will be registered.
- Under **Virtual Disk Configuration:**

  Use the above datastore and directory - allows you to recover using the selections that you have just made on Recover Virtual Machines Wizard.

  Use the original configuration - allows you to recover with the same configuration that exists for the VM at the time of the backup.

  Change each virtual disk's configuration - allows you to customize each disk's name, target location, and provision type.

b Select **Next**. The **Recover Virtual Machines Wizard** (Verify the configuration of the VM to be restored) dialog box displays (see Figure 93). Proceed to Step 4.

Figure 92 Select Target Virtual Machine

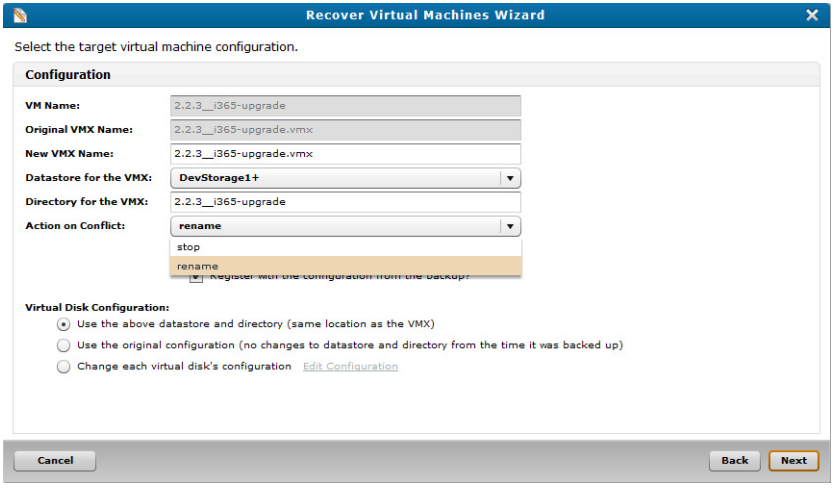
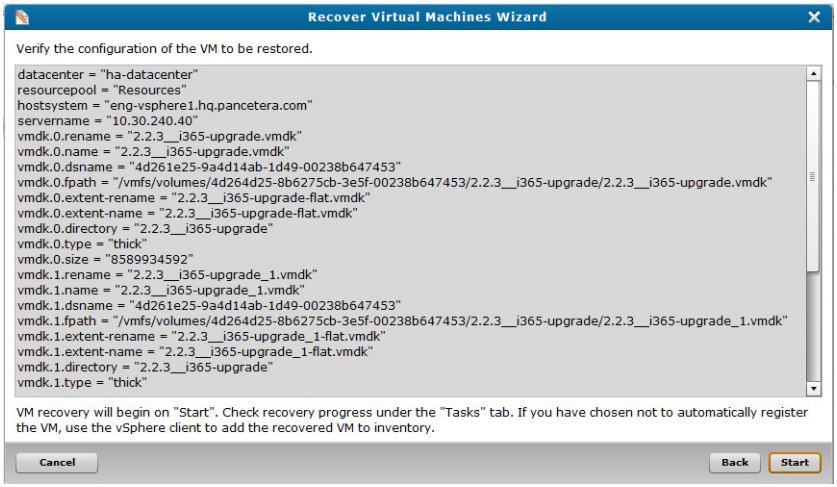


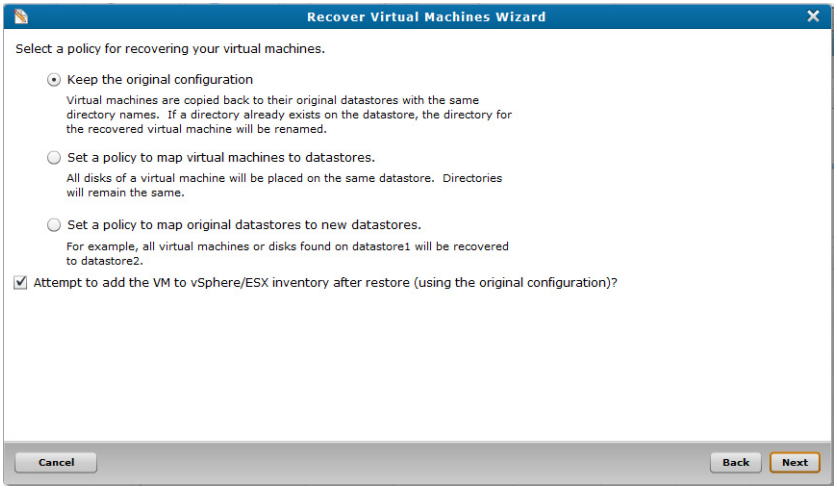
Figure 93 Starting a Recovery for a VM


Recover Virtual Machines Wizard
Verify the configuration of the VM to be restored.
datacenter = "ha-datacenter"
resourcepool = "Resources"
hostsystem = "eng-vsphere1.hq.pancetera.com"
servername = "10.30.240.40"
vmdk.0.rename = "2.2.3__i365-upgrade.vmdk"
vmdk.0.name = "2.2.3__i365-upgrade.vmdk"
vmdk.0.dsname = "4d261e25-9a4d14ab-1d49-00238b647453"
vmdk.0.fpath = "/vmfs/volumes/4d264d25-8b6275cb-3e5f-00238b647453/2.2.3__i365-upgrade/2.2.3__i365-upgrade.vmdk"
vmdk.0.extent-rename = "2.2.3__i365-upgrade-flat.vmdk"
vmdk.0.extent-name = "2.2.3__i365-upgrade-flat.vmdk"
vmdk.0.directory = "2.2.3__i365-upgrade"
vmdk.0.type = "thick"
vmdk.0.size = "8589934592"
vmdk.1.rename = "2.2.3__i365-upgrade_1.vmdk"
vmdk.1.name = "2.2.3__i365-upgrade_1.vmdk"
vmdk.1.dsname = "4d261e25-9a4d14ab-1d49-00238b647453"
vmdk.1.fpath = "/vmfs/volumes/4d264d25-8b6275cb-3e5f-00238b647453/2.2.3__i365-upgrade/2.2.3__i365-upgrade_1.vmdk"
vmdk.1.extent-rename = "2.2.3__i365-upgrade_1-flat.vmdk"
vmdk.1.extent-name = "2.2.3__i365-upgrade_1-flat.vmdk"
vmdk.1.directory = "2.2.3__i365-upgrade"
vmdk.1.type = "thick"
VM recovery will begin on "Start". Check recovery progress under the "Tasks" tab. If you have chosen not to automatically register the VM, use the vSphere client to add the recovered VM to inventory.
Cancel
Back
Start

3 On the **Recover Virtual Machines Wizard** (see Figure 94),select the policy that you want to use to recover the VMs, and then select **Next**. The **Recover Virtual Machines Wizard** confirmation dialog box displays (see Figure 95).

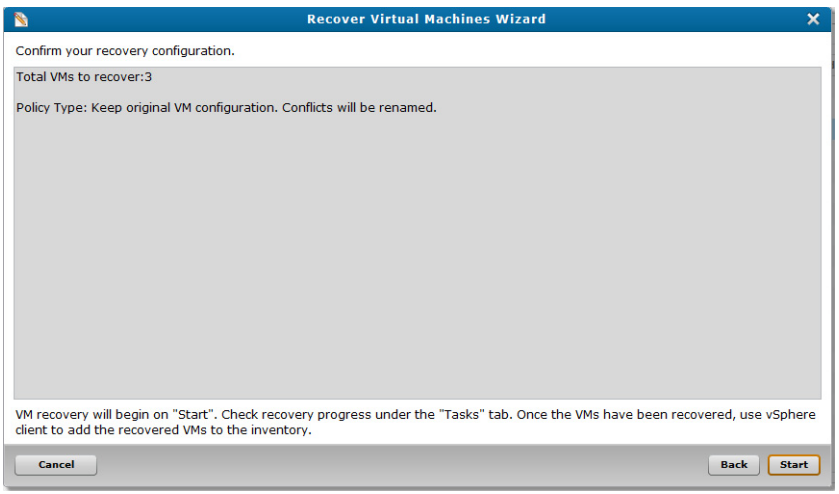
- If you select **Attempt to add the VMs to vSphere/ESX inventory after restore (using the original configuration)?**, keep in mind that when recovering multiple VMs, there is no rename option; therefore, the VMs must be removed before they can be recovered.
- If you choose to Set a policy, use the **Recover Virtual Machines Wizard** (Configure policy mappings) dialog box to configure you policy.

Figure 94 Select Recovery Policy


Recover Virtual Machines Wizard
Select a policy for recovering your virtual machines.
Keep the original configuration
Virtual machines are copied back to their original datastores with the same directory names. If a directory already exists on the datastore, the directory for the recovered virtual machine will be renamed.
Set a policy to map virtual machines to datastores.
All disks of a virtual machine will be placed on the same datastore. Directories will remain the same.
Set a policy to map original datastores to new datastores.
For example, all virtual machines or disks found on datastore1 will be recovered to datastore2.
Attempt to add the VM to vSphere/ESX inventory after restore (using the original configuration)?
Cancel
Back
Next

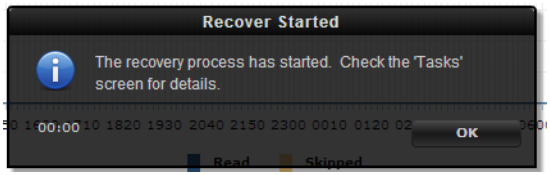
4 On the **Recover Virtual Machines Wizard** confirmation dialog box (either Figure 93 or Figure 95), select **Start.** The **Recovery Started** alert box displays (see Figure 96).

Figure 95 Recovery Confirmation


Recover Virtual Machines Wizard
Confirm your recovery configuration.
Total VMs to recover:3
Policy Type: Keep original VM configuration. Conflicts will be renamed.
VM recovery will begin on "Start". Check recovery progress under the "Tasks" tab. Once the VMs have been recovered, use vSphere client to add the recovered VMs to the inventory.
Cancel
Back
Start

View the progress of a recovery.

Figure 96 Recovery Started



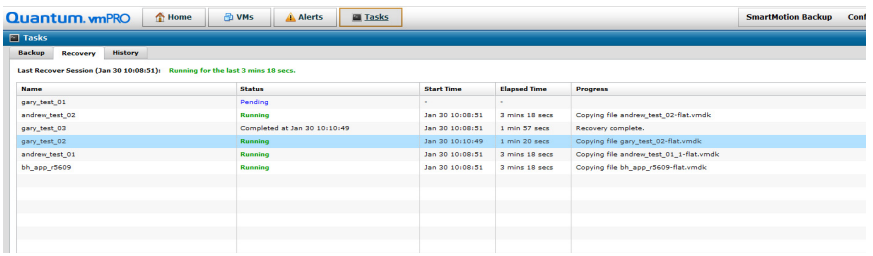
To view the progress of the recovery or to see the list of VMs that were recovered, do the following:

1 From the vmPRO GUI, select the **Tasks** tab.

2 From the **Tasks** screen, select the **Recovery** tab (see Figure 97).

Note: If you need to stop the recovery, select **Abort recovery**

Figure 97 Recovery of VMs


Quantum vmPRO
Home
VMs
Alerts
Tasks
SmartMotion Backup
Tasks
Backup
Recovery
History
Last Recover Session (Jan 30 10:08:51): Running for the last 3 mins 18 secs.
Name
Status
Start Time
Elapsed Time
Progress
gary_test_01 Pending
andrew_test_02 Running Jan 30 10:08:51 3 mins 18 secs Copying file andrew_test_02-flat.vmdk
gary_test_03 Completed at Jan 30 10:10:49 Jan 30 10:08:51 1 min 57 secs Recovery complete.
gary_test_02 Running Jan 30 10:10:49 1 min 20 secs Copying file gary_test_02-flat.vmdk
andrew_test_01 Running Jan 30 10:08:51 3 mins 18 secs Copying file andrew_test_01_1-flat.vmdk
bh_app_r5609 Running Jan 30 10:08:51 3 mins 18 secs Copying file bh_app_r5609-flat.vmdk

Manually Register an Imported VM

In the event of errors that prevent VMs from being registered or if you did not select **Add the VM to vSphere/ESX inventory after restore?**, you will need to manually register an imported VM.

To manually register an imported VM, do the following:

1 Using a vSphere client, log in to the server (ESX or vCenter) where the VM resides. select the server tree in the left panel, and then select the **Summary** tab.

2 Right click the **Storage** location of the recovered VM and select **Browse Datastore**.

3 Find the VM directory (newly created recovery process) and open it.

4 Right click the **.vmx** file and select **Add to Inventory**.

5 Select the location where you want to put the VM.

The VM will automatically be **Discovered**. The VM will only be automatically exported if you have **Automatically export new VMs** enabled.

Exchange Recovery

Before beginning an **Exchange Recovery**, make sure the following prerequisites are met:

- Exchange Recovery uses the Exchange Management Shell and requires a working/functional Exchange Management Shell to successfully execute an Exchange mailbox recovery.
- The Windows Management Framework 3.0 must be installed when using Exchange servers running Windows 2008R2 and Exchange 2010.
- The **Exchange Recovery** feature supports only a single network interface configuration. Using the VMware tools, the vmPRO specifies the IP address for eth0 as the iSCSI portal. This is the only network path by which the vmPRO can access the Exchange server.
- You must configure your **iSCSI Write Area** settings. For each iSCSI target, there is a file created on the iSCSI write area storage. When data is written to the iSCSI disk, that data is stored in the write area, which is an area separate from the area used for the backed-up data. The configuration for the **iSCSI Write Area** specifies the amount of space per iSCSI target that can be used.

  To configure your **iSCSI Write Area** settings, do the following:

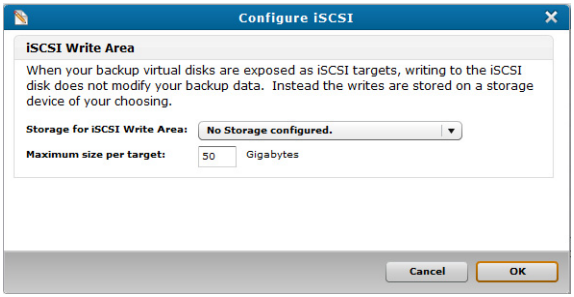
  1 From the **Configure** drop-down list, select **iSCSI**.

  2 On the **Configure iSCSI** dialog box, do the following: (see Figure 98):

    - Select the **Storage for iSCSI Write Area**.
    - Enter the **Maximum size per target**.

  3 Click **OK**.

Figure 98 iSCSI Write Area Settings


Configure iSCSI
iSCSI Write Area
When your backup virtual disks are exposed as iSCSI targets, writing to the iSCSI disk does not modify your backup data. Instead the writes are stored on a storage device of your choosing.
Storage for iSCSI Write Area:
No Storage configured.
Maximum size per target:
50
Gigabytes
Cancel
OK

- The best results are seen when the backup has been completed with the Quantum VSS agent enabled (see Select the VMs to be exported on page 73). If you are using the Quantum VSS agent, you must use version 1.3 or higher (see Quantum VSS Writer on page 149).
- You will need a mailbox on the target Exchange server (server in which you will recover your mailbox). Make sure that mailbox has enough space to hold the recovered mailbox; otherwise, the recovery will fail.
- If you are using a Quantum VSS agent to perform the backup of mailboxes on an Exchange server, you need to add the Exchange server to the Organization Management domain group within Microsoft Exchange. This addition of the Exchange server to the domain group enables the Quantum VSS agent to capture the mailbox database information during a backup.Otherwise, during recovery of the Exchange server's mailboxes, vmPRO is unable to list the mailbox databases located on the backed-up Exchange server. You can still proceed with the Exchange Recovery; however, you must do so by manually browsing to the Exchange server's database .edb file and corresponding transaction log directory.

  To add an Exchange server to the Organization Management domain group for Microsoft Exchange 2013:

  1. Open the Microsoft Exchange 2013 **Exchange admin center** page in a local browser (https://<Exchange Server IP Address>/ecp/default.aspx). See Figure 99.
  2. Select the **Permissions** tab, and then select the **admin roles** tab.
  3. Double-click **Organization Management** to display the **Role Group** window.

4 In the **Members** list, click the plus icon to display the **Select Members** window (see Figure 100).

5 In the displayed list, select **Exchange Servers** and click **add** to add the name to the Organization Management domain group.

6 Click **ok** to return to the **Role Group** window, with **Exchange Servers** displayed in the **Members** list (see Figure 101).

7 Click **Save** to exit the window and save changes.

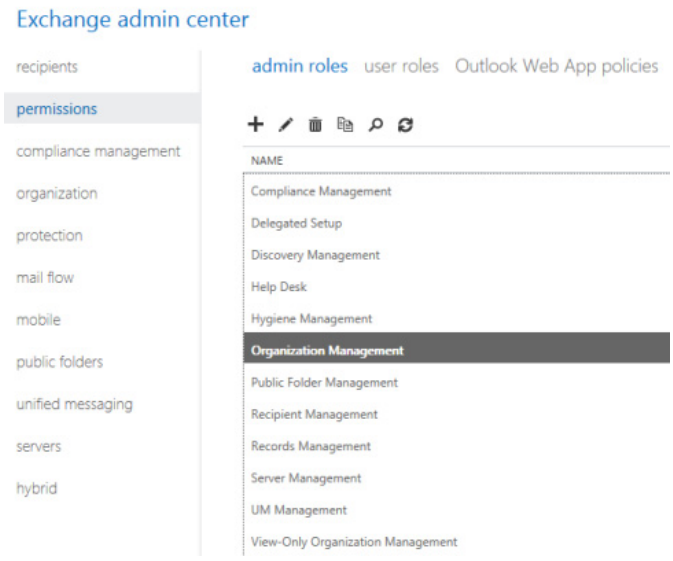


Figure 99 Microsoft Exchange 2013 Exchange Admin Center

Figure 100 Select Members 2013

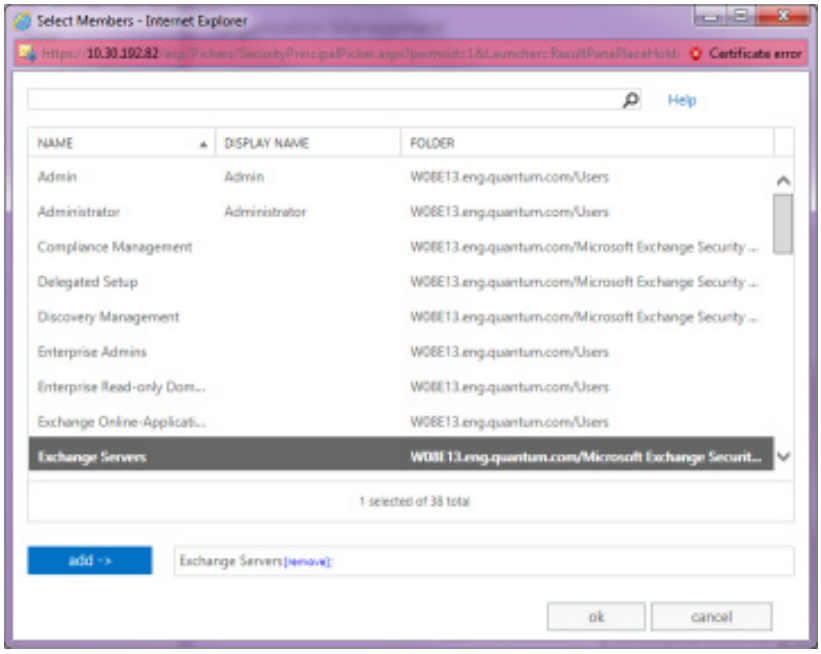
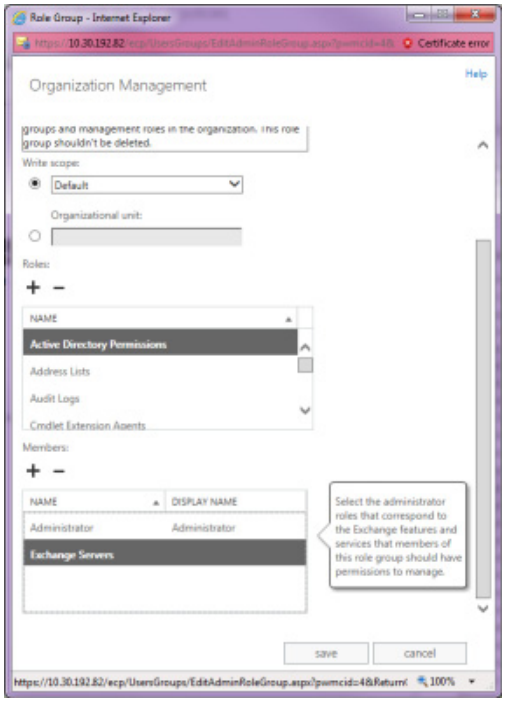


Figure 101 Role Group 2013



To add an Exchange server to the Organization Management domain group for Microsoft Exchange 2010:

1. Open the Microsoft Exchange 2010 **Exchange Server** page in a local browser (https://<Exchange Server IP Address>/ecp/). See Figure 102.
2. Select the **Roles and Auditing** tab, and then select the **Administrator Roles** tab.
3. Double-click **Organization Management** to display the **Role Group** window.
4. In the **Members** list, click the plus icon to display the **Select Members** window (see Figure 103).
5. In the displayed list, select **Exchange Servers** and click **Add** to add the name to the Organization Management domain group.
6. Click **OK** to return to the **Role Group** window, with **Exchange Servers** displayed in the **Members** list (see Figure 104).

7 Click **Save** to exit the window and save changes.

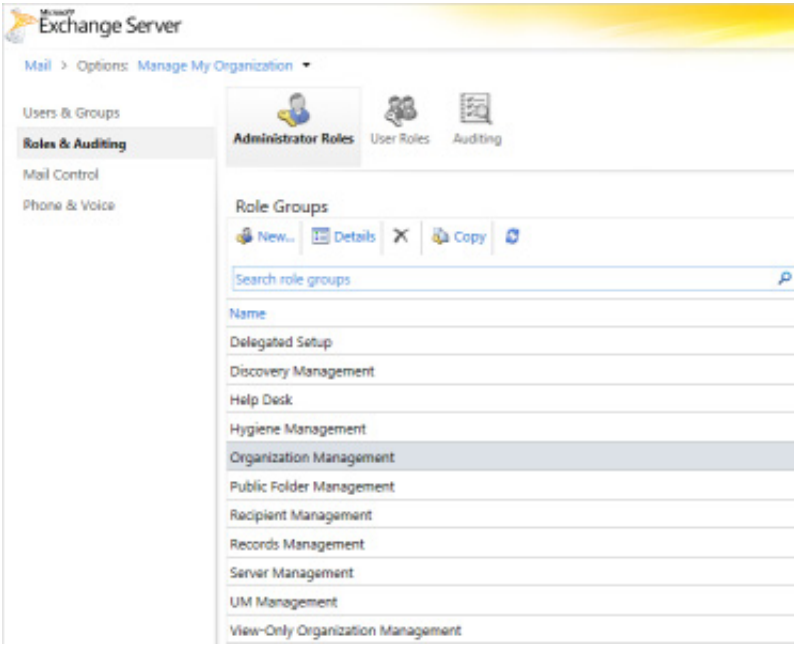


Figure 102 Microsoft Exchange 2010 Exchange Admin Center

Figure 103 Select Members 2010

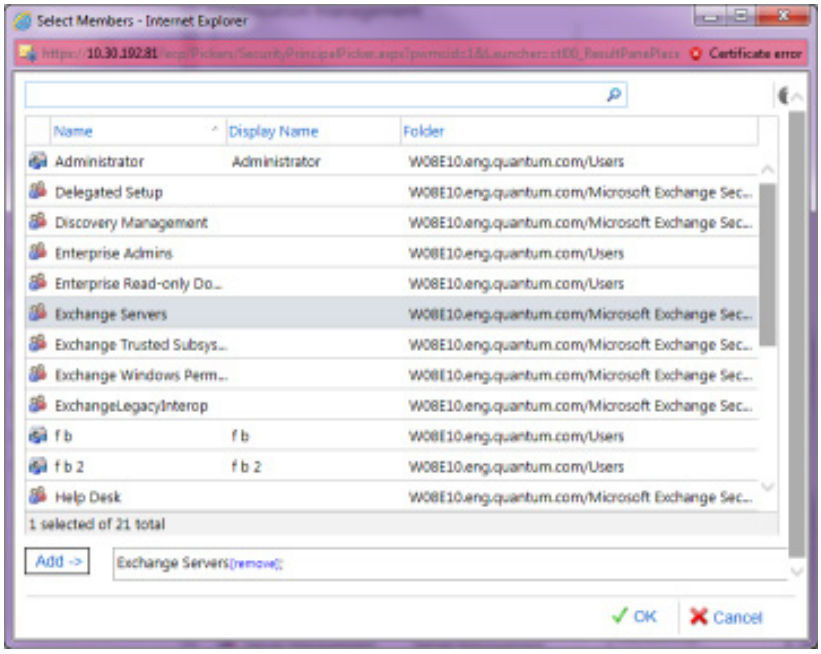
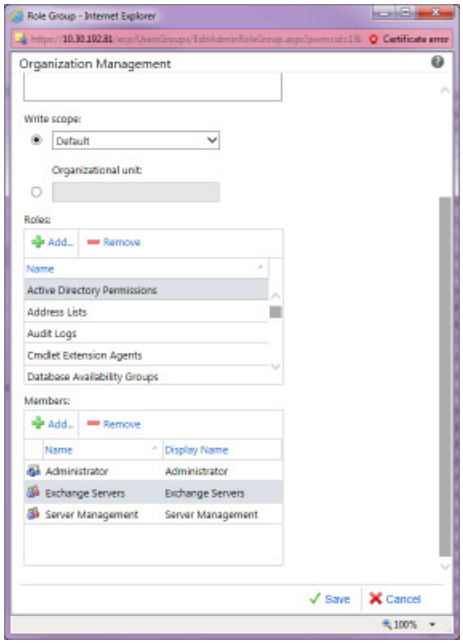


Figure 104 Organization Management Properties 2010

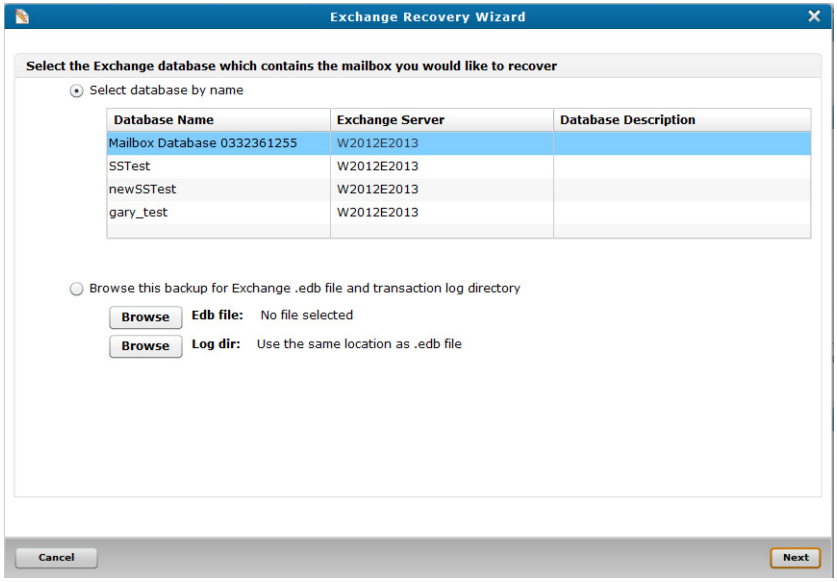


To run an Exchange Recovery:

1 If you are using VSS, in the **Exchange Recovery Wizard**, select the Exchange database that contains the mailbox you want to recover (see Figure 105).

Click **Next**. The the **Exchange Recovery Wizard** vCenter/ESX server information dialog box displays (see Figure 107). Proceed to Step 4 on page 113.

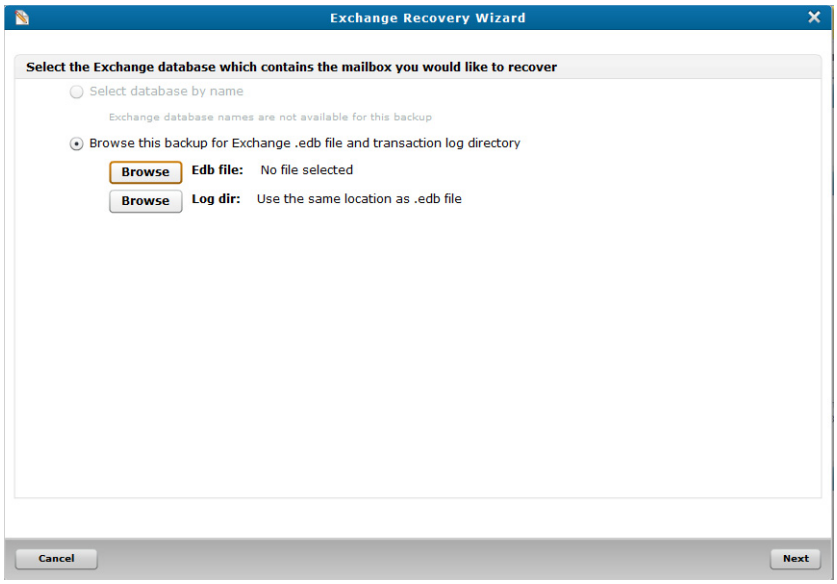
Figure 105 Select Exchange Database



2 If you are not using VSS, use the **Exchange Recovery Wizard** to browse to your **Edb** file location (see Figure 106).

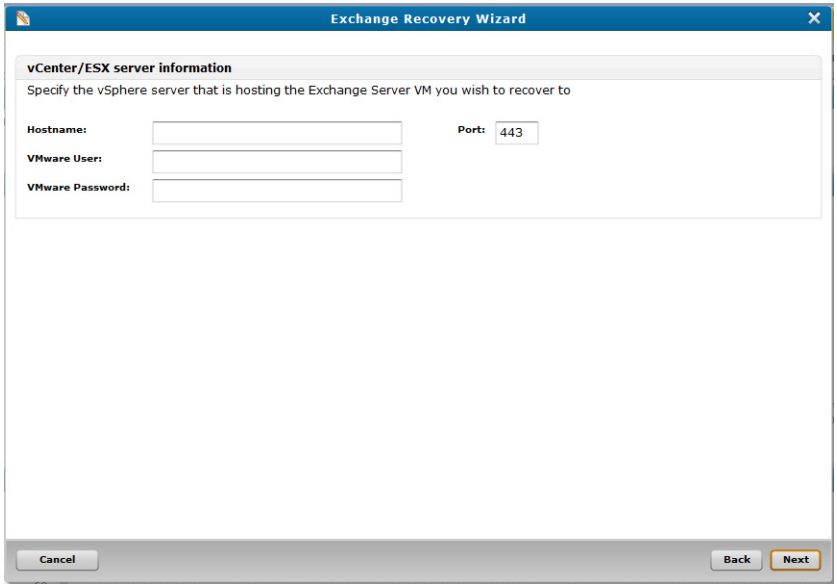
Note: When you complete a backup without VSS enabled, you will see a **Database Listing Unavailable** dialog box warning, just click **OK**, and then browse to the files.

Figure 106 Browse to Edb File


Exchange Recovery Wizard
Select the Exchange database which contains the mailbox you would like to recover
Select database by name
Exchange database names are not available for this backup
Browse this backup for Exchange .edb file and transaction log directory
Browse
Edb file:
No file selected
Browse
Log dir:
Use the same location as .edb file
Cancel
Next

3 When you have selected your **Edb** file and **Log dir**, click **Next**. The the **Exchange Recovery Wizard** vCenter/ESX server information dialog box displays (see Figure 107).

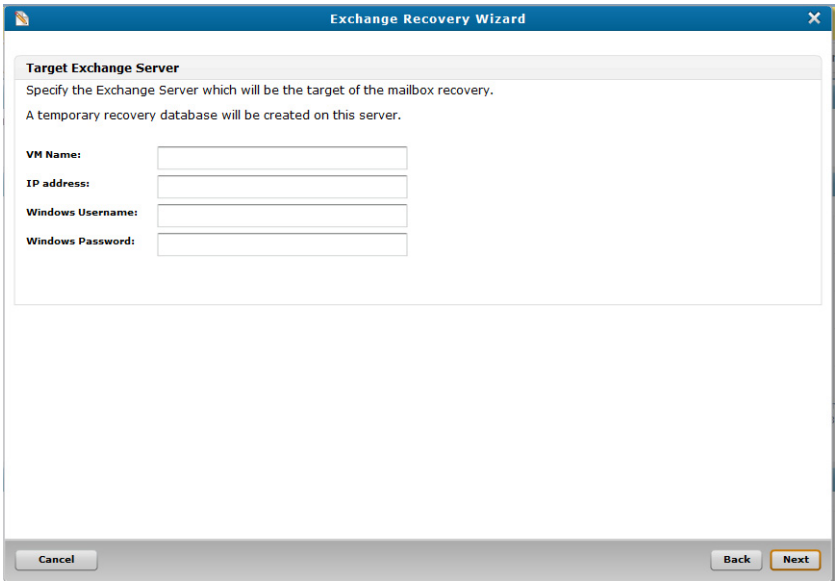
Figure 107 Enter VMware Credentials



4 In the **Exchange Recovery Wizard** vCenter/ESX server information dialog box, enter your VMware login credentials: **Hostname**, **VMware User**, and **VMware Password**.

Click **Next**. The **Exchange Recovery Wizard** Target Exchange Server dialog box displays (see Figure 108).

Figure 108 Enter Exchange Server Credentials



5 In the **Exchange Recovery Wizard** Target Exchange Server dialog box, enter your Exchange Server's credentials: **VM Name**, **IP address**, **Windows Username**, and **Windows Password**.

Note: Because Exchange Recovery requires administrator access to the guest Exchange server VM, you must provide Windows credentials with administrator privileges.

Click **Next**. The **Recovery Database Setup Status** dialog box displays (see Figure 109). When the recovery database setup has completed, control returns to the **Exchange Recovery Wizard** Target Exchange Server dialog box (see Figure 110).

Figure 109 Recovery Database Status

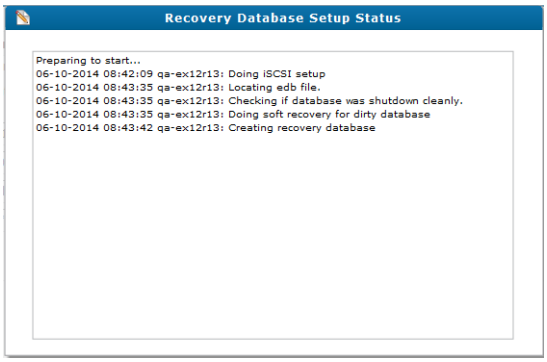
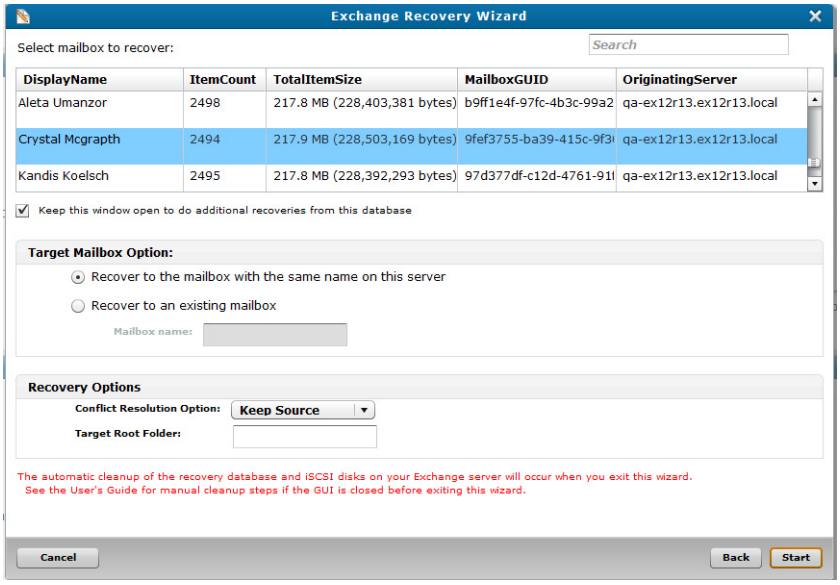

Recovery Database Setup Status
Preparing to start...
06-10-2014 08:42:09 qa-ex12r13: Doing iSCSI setup
06-10-2014 08:43:35 qa-ex12r13: Locating edb file.
06-10-2014 08:43:35 qa-ex12r13: Checking if database was shutdown cleanly.
06-10-2014 08:43:35 qa-ex12r13: Doing soft recovery for dirty database
06-10-2014 08:43:42 qa-ex12r13: Creating recovery database

Figure 110 Select Mailbox to Recover



6 In the **Exchange Recovery Wizard** Target Exchange Server dialog box:

   a Select the mailbox you want to recover. (You can only restore one mailbox at a time.)

   b Select or clear **Keep this window open to do additional recoveries from this database** as appropriate.

c Select the **Target Mailbox Option**: **Recover to the mailbox with the same name on this server** or **Recover to an existing mailbox** (enter the mailbox name if you select this option).

d Select or enter the **Recovery Options**.

- **Conflict Resolution Option**: This parameter specifies the action for the Microsoft Exchange Mailbox Replication service (MRS) to take if there are multiple matching messages in the target, Select from: **Keep Source**, **Keep Latest**, **Keep All**.
- (Optional) **Target Root Folder**: This parameter specifies the top-level folder in which to restore data. If not specified, folders are restored to the top of the folder structure in the target mailbox. Content is merged under existing folders, and new folders are created if they do not already exist in the target folder structure.

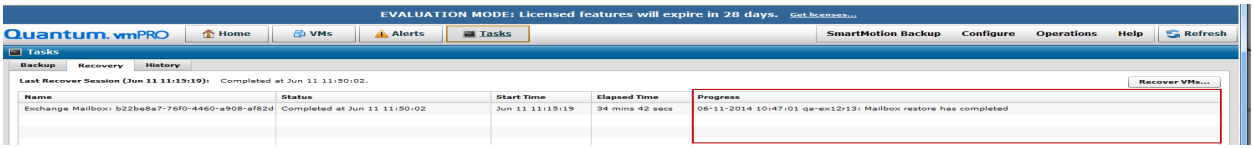
e Click **Start**.

Note: If you abort a mailbox recovery, you will still see mailboxes being moved into the recovery target mailbox for a period time; this is due to a time delay that exists between the abort command and when Exchange server suspends the restore.

7 If **Keep this window open to do additional recoveries from this database** was not selected, you can view the mailbox recovery progress by accessing the vmPRO GUI **Tasks** tab (see Figure 111 and Figure 112).

Figure 111 Access the Tasks Tab for Recovery Progress

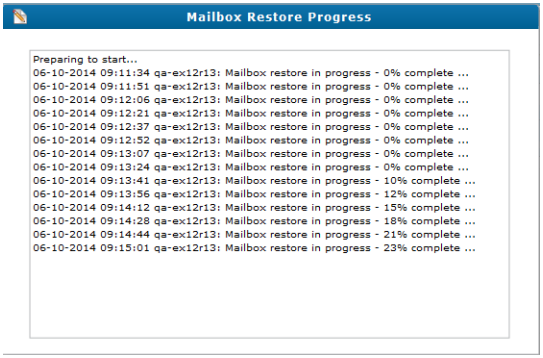
Figure 112 Tasks Tab Restore Progress



When the restore has completed, vmPRO will also have finished its automatic Exchange database cleanup process.

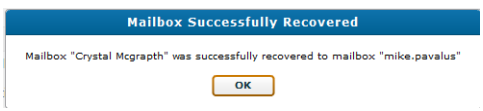
8 If **Keep this window open to do additional recoveries from this database** was selected, the **Mailbox Restore Progress** status displays (see Figure 113).

Figure 113 Restore Progress Status


Mailbox Restore Progress
Preparing to start...
06-10-2014 09:11:34 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:11:51 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:12:06 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:12:21 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:12:37 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:12:52 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:13:07 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:13:24 qa-ex12r13: Mailbox restore in progress - 0% complete ...
06-10-2014 09:13:41 qa-ex12r13: Mailbox restore in progress - 10% complete ...
06-10-2014 09:13:56 qa-ex12r13: Mailbox restore in progress - 12% complete ...
06-10-2014 09:14:12 qa-ex12r13: Mailbox restore in progress - 15% complete ...
06-10-2014 09:14:28 qa-ex12r13: Mailbox restore in progress - 18% complete ...
06-10-2014 09:14:44 qa-ex12r13: Mailbox restore in progress - 21% complete ...
06-10-2014 09:15:01 qa-ex12r13: Mailbox restore in progress - 23% complete ...

When the mailbox restore has completed, **Mailbox Successfully Recovered** dialog box displays, Click **OK** (see Figure 114).

Figure 114 Mailbox Successfully Restored



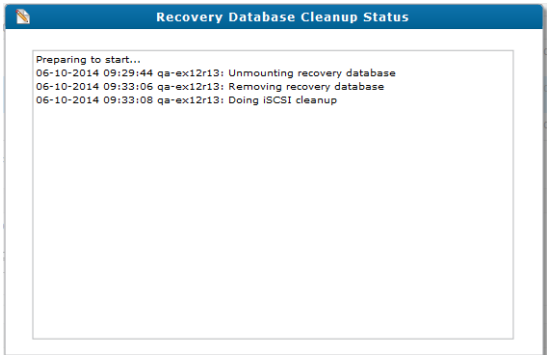
a Continue restoring mailboxes as needed.

b To exit the Exchange server mailbox restore function:

- Clear **Keep this window open to do additional recoveries from this database** before starting the last mailbox recovery.

- Click **Cancel** to have vmPRO begin its Exchange database cleanup process and report its status (see Figure 115).

Figure 115 Database Cleanup


Recovery Database Cleanup Status
Preparing to start...
06-10-2014 09:29:44 qa-ex12r13: Unmounting recovery database
06-10-2014 09:33:06 qa-ex12r13: Removing recovery database
06-10-2014 09:33:08 qa-ex12r13: Doing iSCSI cleanup

Manual Exchange Server Cleanup

During an **Exchange Recovery**, iSCSI disks and the recovery Exchange database are configured on your Exchange server. The cleanup of this configuration is initiated when you exit the **Recovery Wizard** by clicking any of the **back**, **cancel**, or **X** buttons on the **Recovery Wizard** window.

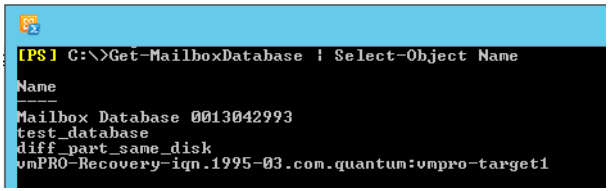
If you close the vmPRO GUI without exiting the **Recovery Wizard** or the browser crashes, the configuration changes made to your Exchange server will not be automatically cleaned up by vmPRO. If this happens, you must do a manual cleanup.

Note: When the option **Keep this window open to do additional recoveries** is not enabled, the vmPRO will perform the cleanup automatically.

To perform a manual Exchange server cleanup, do the following:

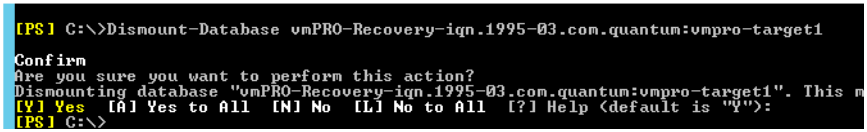
1 From the Exchange Management Shell, use the **Get-MailboxDatabase | Select-Object Name** command to obtain the recovery database name. The database name starts with **vmPRO-Recovery** (see Figure 116).

Figure 116 Obtain the Recovery Database Name



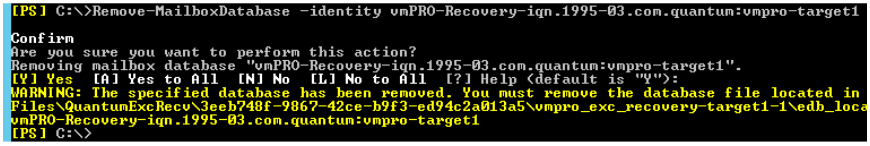
2 Use the **Dismount-Database <database name>** command to dismount the database (see Figure 117)

Figure 117 Dismount the Recovery Database


[PS] C:\>Dismount-Database vmPRO-Recovery-iqn.1995-03.com.quantum:vmpro-target1
Confirm
Are you sure you want to perform this action?
Dismounting database "vmPRO-Recovery-iqn.1995-03.com.quantum:vmpro-target1". This m
[Y] Yes [A] Yes to All [N] No [L] No to All [?] Help (default is "Y"):
[PS] C:\>

3 Use the **Remove-MailboxDatabase -identity <database name>** command to remove the database (see Figure 118)

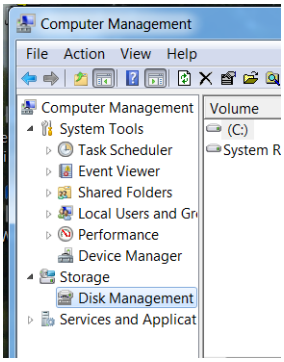
Figure 118 Remove the Recovery Database


[PS] C:\>Remove-MailboxDatabase -identity vmPRO-Recovery-iqn.1995-03.com.quantum:vmpro-target1
Confirm
Are you sure you want to perform this action?
Removing mailbox database "vmPRO-Recovery-iqn.1995-03.com.quantum:vmpro-target1".
[Y] Yes [A] Yes to All [N] No [L] No to All [?] Help (default is "Y"):
WARNING: The specified database has been removed. You must remove the database file located in
Files\QuantumExcRecv\3eeb748f-9867-42ce-b9f3-ed94c2a013a5\vmpro_exc_recovery-target1-1\edb_loca
vmPRO-Recovery-iqn.1995-03.com.quantum:vmpro-target1
[PS] C:\>

4 Unmount all vmPRO mounted volumes.

a Open the **Computer Management** facility and access the **Storage > Disk Management** option (see Figure 119).

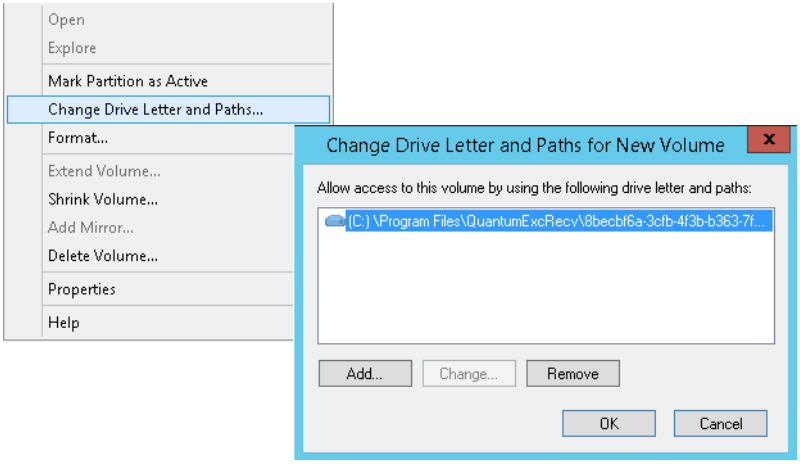
Figure 119 Disk Management



vmPRO will have added one or more disks. More than one disk is added when the **edb** and the transaction logs are on different disks. When the **edb** and the transaction logs are on different partitions on the same disk, there will be two mounted volumes on that disk.

b To see if a volume was mounted by vmPRO, right click the volume and select **Change Drive Letter and Paths**. For vmPRO mounted volumes, you will see **QuanutmExcRecv** (see Figure 120). Click **Remove** to unmount the volume.

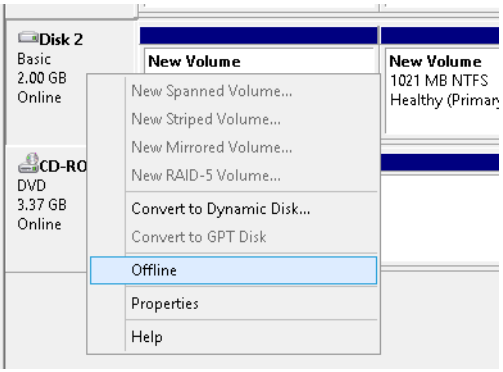
Figure 120 Volumes Mounted by vmPRO



5 Take the volumes **Offline**. For each volume you removed/unmounted in the previous step, take it **Offline**. To take a

volume **Offline**, right click the disk and select **Offline** (see Figure 121).

Figure 121 Take Volumes Offline

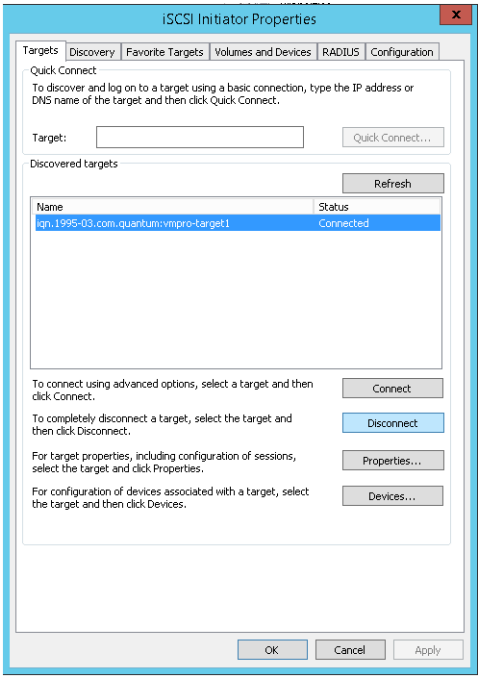


To complete the manual cleanup procedure, access your iSCSI Initiator.

1 Disconnect all vmPRO targets.

In **Targets** tab of the **iSCSI Initiator Properties** dialog box, select the vmPRO target, and then click **Disconnect** (see Figure 122).

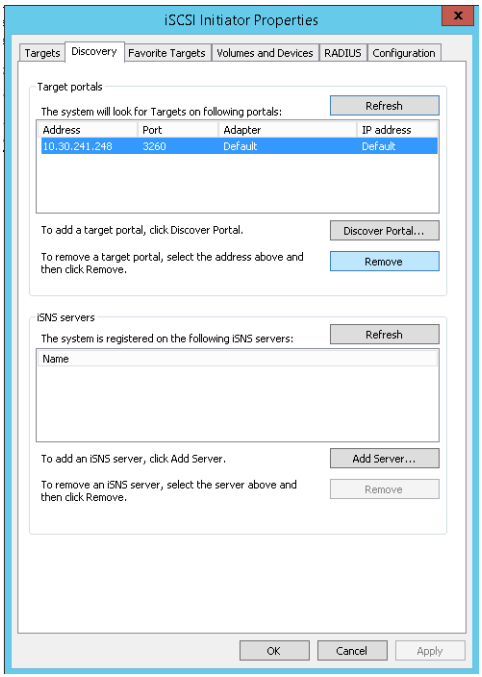
Figure 122 Disconnect vmPRO Targets



2 Remove the vmPRO portal.

In **Discovery** tab of the **iSCSI Initiator Properties** dialog box, select the vmPRO Target Portal, and then click **Remove** (see Figure 123).

Figure 123 Remove the vmPRO Portal



3 Delete the iSCSI target from your vmPRO:

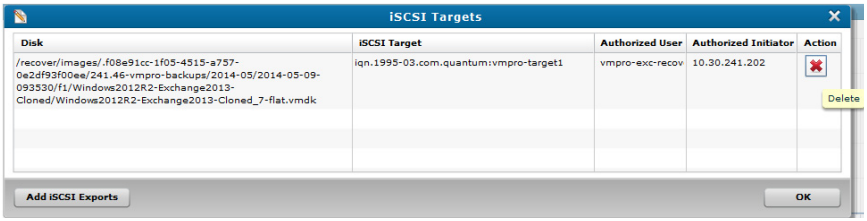
Note: Before starting this step, make sure that all the vmPRO targets have been disconnected (see Step 1).

a On the **SmartMotion Backup** drop-down list, select **iSCSI Targets** (see Figure 124).

Figure 124 iSCSI Targets

b On the **iSCSI Targets** dialog box, click delete (the red X) (see Figure 125).

Figure 125 Delete the iSCSI Target



iSCSI Export

This feature allows you to export/recover your backed up data as disk images (not as file systems as is the case with CIFS and NFS). After backing up disk images, you can export these disk images using vmPRO through iSCSI. You can then access the exported disk images from both virtual or physical machines.

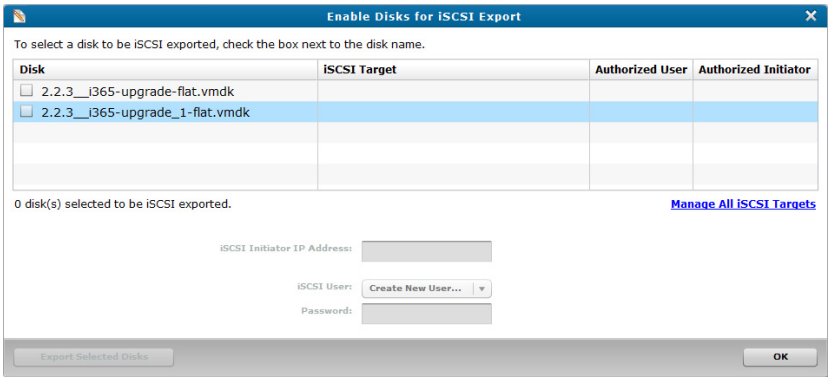
When exporting disk images using vmPRO through iSCSI, the disk images would be mounted by a Windows system, and the files within that disk are accessible on that system. Keep in mind that you can only view recovered Windows-based VMs when using the iSCSI Export feature.

Before using this feature, you must address the following prerequisites:

- You must create a vmPRO user (see Manage Users on page 61); this can also be do from the **Enable Disks for iSCSI Export** dialog box. You cannot use the default sysadmin user. For authentication and security purposes the Window iSCSI Initiator requires a unique user and a 12- to 16-character password.
- You must configure your **iSCSI Write Area** settings (see iSCSI Write Area page page 103). For each iSCSI target there is a file created on the iSCSI write area storage.
- You must have access to the Microsoft iSCSI Initiator, which if installed on your Windows system will usually be in your **Administrative Tools** folder. If the iSCSI Initiator is not installed on your system, you can download it at http://www.microsoft.com/en-us/download/details.aspx?id=18986

When you select **iSCSI Export**, the **Enable Disks for iSCSI Export** dialog box displays (see Figure 126).

Figure 126 Enable Disks for iSCSI Export



1 Select the disks that you want to export.

2 Enter the **iSCSI Initiator IP Address** IP. This is the address of the PC on which you have the iSCSI initiator installed.

3 Select (create if necessary) the **iSCSI User**.

4 Enter the 12- to 16-character **Password** of the iSCSI user.

5 Click **Export Selected Disks**. Control will return to the **Enable Disks for iSCSI Export** dialog box. The already exported disks cannot be selected and the input fields are not active.

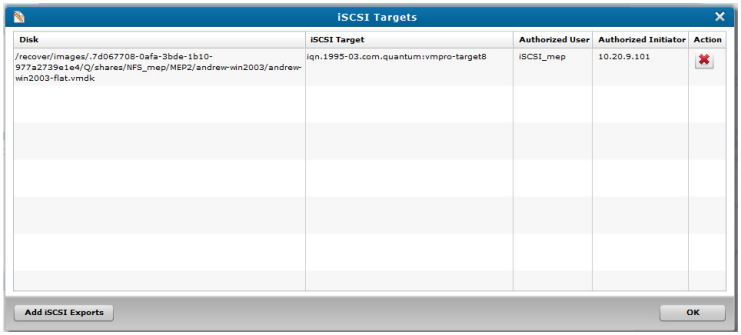
6 (optional) Click **Manage All iSCSI Targets**. The **iSCSI Targets** dialog box displays (see Figure 127). The **iSCSI Targets** dialog box now contains the following information about the disk you have selected for export: **Disk**, **iSCSI Target**, **Authorized User**, **Authorized Initiator**.

   The **iSCSI Target** dialog box **Action** option will allow you to delete the disk (cancel the recovery).

   Click **OK**.

7 Click **OK** to start the recovery.

Figure 127 iSCSI Targets Disks' Information

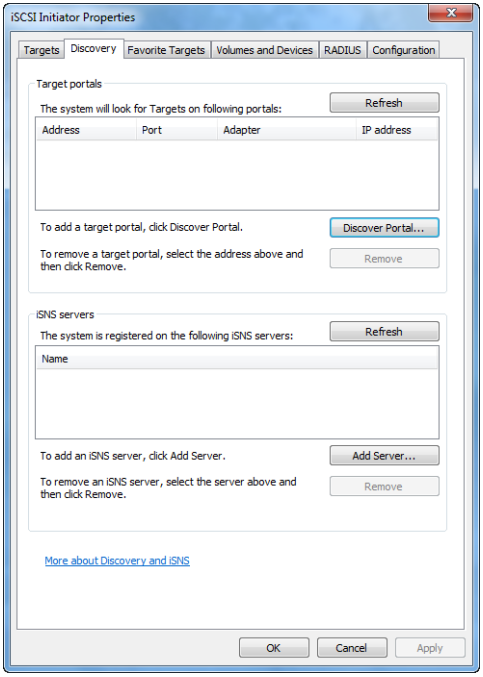


To complete the recovery of the iSCSI VMDKs, access your iSCSI Initiator.

1 Discover the vmPRO.

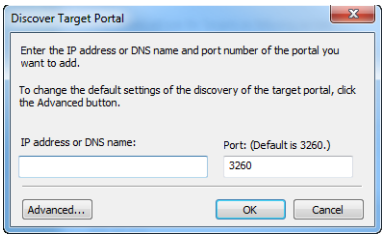
a Select the **Discovery** tab, and then click **Discover Portal** (see Figure 128). The **Discover Target Portal** dialog box displays.

Figure 128 Discover vmPRO



b On the **Discover Target Portal** dialog box (see Figure 129), enter the **IP address of DNS name** of your vmPRO, and then click **OK**.

Figure 129 Discover Target vmPRO

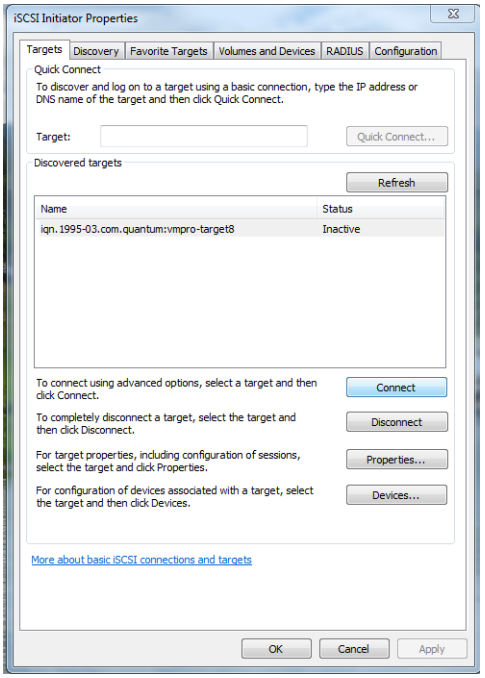

Discover Target Portal
Enter the IP address or DNS name and port number of the portal you want to add.
To change the default settings of the discovery of the target portal, click the Advanced button.
IP address or DNS name:
Port: (Default is 3260.)
3260
Advanced...
OK
Cancel

c Select the **Targets** tab. Your vmPRO will be listed in the **Discovered targets** pane (see Figure 130).

2 Connect, log on, and mount the target.

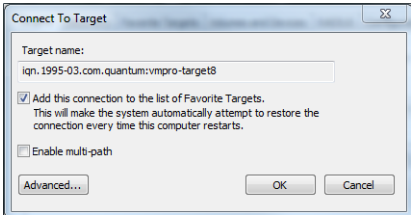
a Select your vmPRO, and then click **Connect** for the **To connect using advanced options, select a target and the click Connect** option (see Figure 130). The **Connect To Target** dialog box displays.

Figure 130 Connect to target vmPRO


iSCSI Initiator Properties
Targets
Discovery
Favorite Targets
Volumes and Devices
RADIUS
Configuration
Quick Connect
To discover and log on to a target using a basic connection, type the IP address or DNS name of the target and then click Quick Connect.
Target:
Quick Connect...
Discovered targets
Refresh
Name
Status
iqn.1995-03.com.quantum:vmpro-target8
Inactive
To connect using advanced options, select a target and then click Connect.
Connect
To completely disconnect a target, select the target and then click Disconnect.
Disconnect
For target properties, including configuration of sessions, select the target and click Properties.
Properties...
For configuration of devices associated with a target, select the target and then click Devices.
Devices...
More about basic iSCSI connections and targets
OK
Cancel
Apply

b On the **Connect To Target** dialog box, click Advanced (see Figure 131). The **Advanced Settings** dialog box displays.

Figure 131 Connect to Target Advanced Options


Connect To Target
Target name:
iqn.1995-03.com.quantum:vmpro-target8
Add this connection to the list of Favorite Targets.
This will make the system automatically attempt to restore the connection every time this computer restarts.
Enable multi-path
Advanced...
OK
Cancel

c On the **Advanced Settings** dialog box, do the following (see Figure 132):

- Select **Enable CHAP log on.**
- For **Name:** enter the vmPRO user name you enter when you created the vmPRO iSCSI user (see iSCSI Export on page 123).

- For **Target secret:** enter the vmPRO user password you enter when you created the vmPRO iSCSI user (see iSCSI Export on page 123).
- Click **OK** on the **Advanced Settings** dialog box.
- Click **OK** on the **Connect to Target** dialog box.

An **AutoPlay** dialog box for your local disk displays (see Figure 133). You can access the file on this VMDK as you would any other files on your Windows system.

Note: Do not close the iSCSI Initiator after connecting to the target. If you close the iSCSI Initiator, the **AutoPlay** dialog box will not display, and you will be unable to access the files on the VMDKs without repeating the discovery and connection process.

Figure 132 Advanced Setting for Target vmPRO

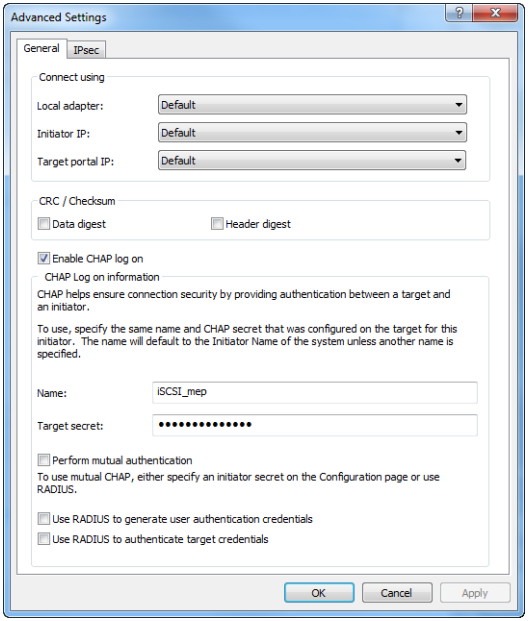
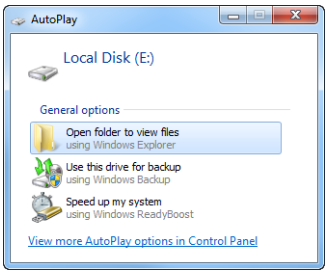

Advanced Settings
General
IPsec
Connect using
Local adapter:
Default
Initiator IP:
Default
Target portal IP:
Default
CRC / Checksum
Data digest
Header digest
Enable CHAP log on
CHAP Log on information
CHAP helps ensure connection security by providing authentication between a target and an initiator.
To use, specify the same name and CHAP secret that was configured on the target for this initiator. The name will default to the Initiator Name of the system unless another name is specified.
Name:
iSCSI_mep
Target secret:
Perform mutual authentication
To use mutual CHAP, either specify an initiator secret on the Configuration page or use RADIUS.
Use RADIUS to generate user authentication credentials
Use RADIUS to authenticate target credentials
OK
Cancel
Apply

Figure 133 iSCSI Disk Connected



iSCSI Configuration Notes

The following should be kept in mind when using the i**SCSI Targets** feature:

- The target is exported to only a specific initiator IP; others initiators cannot discover the target.
- You cannot delete a target when the initiator is connected.
- You cannot delete the vmPRO user when the initiator is connected.
- You cannot delete the vmPRO user when the iSCSI user is bound/configured to iSCSI target.
- You cannot change the vmPRO user's password when the iSCSI user is bound/configured to the iSCSI target or when the iSCSI user is in use.
- When exported, an iSCSI target will consume some of the system resources. You should remove unused iSCSI targets. The controller keeps track of how long a target is exported and generates a warning alert when the target has been exposed for more than 24 hours.
- When the vmPRO is rebooted:
  - The iSCSI mount/connection is lost and all the previous writes are lost.
  - Previously exported targets are not available.
  - You must re-create the iSCSI targets.

Manually Recover a VM Backed up using a Third-Party Application

Before you can manually recover a VM that was backed up using a third-party backup application, you must perform the following steps that will allow your vmPRO to access the VM:

1. Restore the VM using your third-party application. (If the location where the VM has been recovered can be accessed by your vmPRO, this location can be your *staging area*.)
2. If the location where your third-party application has located the restored VM is not accessible to your vmPRO, create a staging area on a host other than your vmPRO. This area can be on any NAS device that is accessible to both the system where the third-party backup software is installed and your vmPRO appliance.
3. In the location where your third-party application restored the VM, you will see a directory with the same name as the VM that you want to recover. Make sure that directory and all of its contents are in the staging area.

   Note: The following files should be in that directory:

   <VM name>-flat.vmdk - This is the full base disk image.

   <VM name>-pancbt.vmdk - Needed if using Changed Block Tracking. This is the file containing the changed blocks since the last reset **<VM name>-flat.vmdk** file was written. You should have one **<VM name>-pancbt.vmdk** file per flat file; you need only the latest **<VM name>-pancbt.vmdk** file for each flat file.

   <VM name>-.vmx - This is the VM's configuration file.

4. Add the staging area to the vmPRO as additional storage (see Using Additional Storage on page 76). This will allow the **Recover Virtual Machines Wizard** to access all the directories in the staging area.
5. Access the **Recover Virtual Machines Wizard** dialog box.

   Note: The filter options are currently not available for the manual recovery option.

6. Proceed to Step c on page 95 of Recover VMs Backed up using SmartMotion.

Note: After performing a manual recovery, you must return to your staging area and delete the files. The vmPRO will not remove any of the files.

Recovering Individual Files

Individual files in backed-up virtual machines are available without running the recovery process. File-level recovery allows you to use the vmPRO appliance to access the files within the virtual disks that are backed up. Using Windows Explorer (not a browser) on your local computer, enter the UNC path **\\<vmPRO-Host_IP>\recover\files**, and then drill down the directory structure to the file (see Figure 134).

Note: File-level recovery for dynamic volumes that span multiple disks is currently not supported.

The vmPRO SmartView feature supports the following file system types:

- EXT2, EXT3, and EXT4
- NTFS
- FAT

The vmPRO SmartView feature supports the following partition types:

- MBR (Master Boot Record) partitions.
- GPT (GUID Partition Table) partitions.

The vmPRO SmartView feature also works with supported file systems that are embedded in LVM2 volumes that do not span multiple virtual disks.

Limitations

The vmPRO SmartView feature has limited support for Windows dynamic disks. For Windows 2003, only a simple Windows dynamic disks with a single partition is supported. If there are multiple partitions on a Windows 2003 dynamic disk, file-level access will only be available for the first partition.

The vmPRO SmartView feature does not support the following:

- Windows dynamic disks that span multiple drives
- Windows dynamic disks that are striped

- Windows dynamic disks that use RAID
- Windows 2008 dynamic disks file level access
- volumes that span multiple virtual disks
- Solaris UFS file systems
- file systems on raw (un-partitioned disks)
- physical/logical LVM partitions that have been created on *raw* (un-partitioned) disks
- any file system types that are not explicitly listed as supported

Note: When a third-party backup application is in use, you must use the third-party backup application to recover the entire virtual machine to a network share and then mount that share onto vmPRO using the vmPRO Recover Wizard; see Manually Recover a VM Backed up using a Third-Party Application on page 130 of Recover Data. (When using SmartMotion, only the target backup storage needs to be mounted using the vmPRO Recover Wizard.)

In general, the drill-down process will proceed as follows:

Note: The same procedure applies for NFS, just NFS mount to **/recover**.

1. CIFS mount the vmPRO **/recover** share.
2. **cd** to the **files** directory. Verify that you are in the **/recover/files** directory.
3. There is a directory for each configured target storage. **cd** to your backup data.

   When you **cd** into a VM directory it will contain a **.volume** directory for each disk.
4. **cd** into the **.volume** directory. There you will see directories named **0**, **1**, **2**,... etc. for each partition on the disk. You can **cd** into each numbered directory to access the files for the respective partition.

   Note: The partitions will be automatically mounted; however, there could be a short delay during the automatic mount process.

Under **/recover/files**, the hierarchy is:

storage-target

yyyy-mm (month of backup)

yyyy-mm-dd-tttt (date and time of backup)

folder-name (such as ESX server)

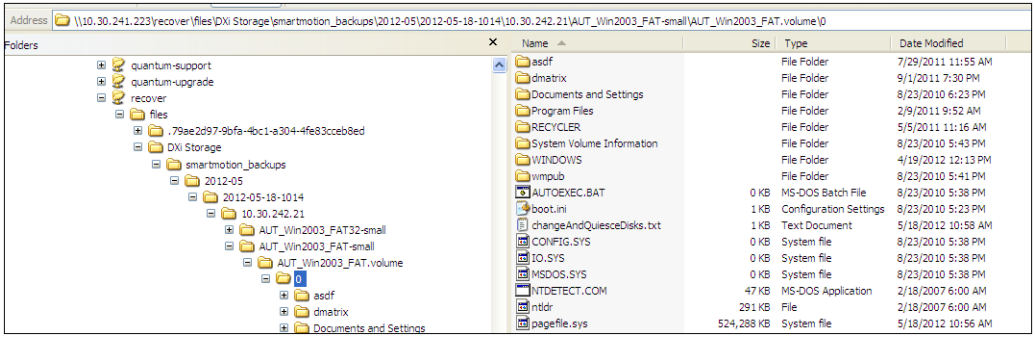
VM-name

disk-name

partition-number (such as 0, 1, …)

files-and-directories

Figure 134 Recovering an Individual File



Chapter 5

Using Groups and Folders With Quantum vmPRO

This chapter describes how to create, set up, and manage groups and folders for more efficient and faster backups.

Set Up and Manage Groups

If a single appliance does not provide enough throughput to complete backups in the desired window, additional appliances may be deployed in the environment.

Note: If you plan to use more than one vmPRO as part of your backup solution, the vmPROs should be set up in a group configuration. Keep in mind that the nodes in a Master/Slave relationship can only export one vCenter server. If two stand alone nodes are joined together the appliance in a Master role will supersede the export priority of the slaves roles.

Group Mode streamlines the management of multiple appliances. When configuring Group Mode, one appliance is selected as the master. You then configure and manage all the other appliances from the master appliance.

You can distribute backups across other vmPRO nodes using a single capacity based license. Once installed, the single license is shared by the group and the capacity of the entire group is managed by the one capacity license.

Note: The capacity license will be shared with all exported capacity from all nodes counting against the license.

To take advantage of Group Mode Licensing, you must install multiple vmPRO appliances, designate one as the Master, and then add the other vmPRO appliances as nodes of the Master. To accomplish this, do the following:

1. Install a vmPRO (the one you want to use as the Master).
2. Install the capacity license that you have purchased. Follow the instructions presented by the Licenses Wizard (see Configure Quantum vmPRO on page 32.
3. Configure the vmPRO as the Master; see Create the Group's Master on page 137.
4. Install all the vmPRO appliances that you want to be nodes (appliances managed by this Master).
5. Configure each node (add it to the group managed by this master); see Add Quantum vmPRO Appliances to a Group on page 138.

Use the following to help you set up your groups:

- Before deploying multiple appliances in Group Mode, confirm each appliance has network connectivity and DNS resolution. Use the **net ping** command from the appliance's console command line to verify that each appliance can ping the other appliances that will be part of the group (ping by name if using DNS). Perform this test before creating the group, to ensure proper functioning of the group deployment.
- DNS resolution failures or IP routing issues in the group deployment may cause backup jobs to fail for VMs assigned to the misconfigured nodes.
- Verify that all group members/nodes have been upgraded to the same release version of the appliance, for example 3.1.
- Create your folders on the master appliance. They will appear on all nodes.

Note: If you need to migrate your VMs to another ESX server, and you do not want the VMs to be assigned to the master node, you must manually assign the VMs to the preferred node (see Increase Backup Throughput on page 140).

Set Up Groups

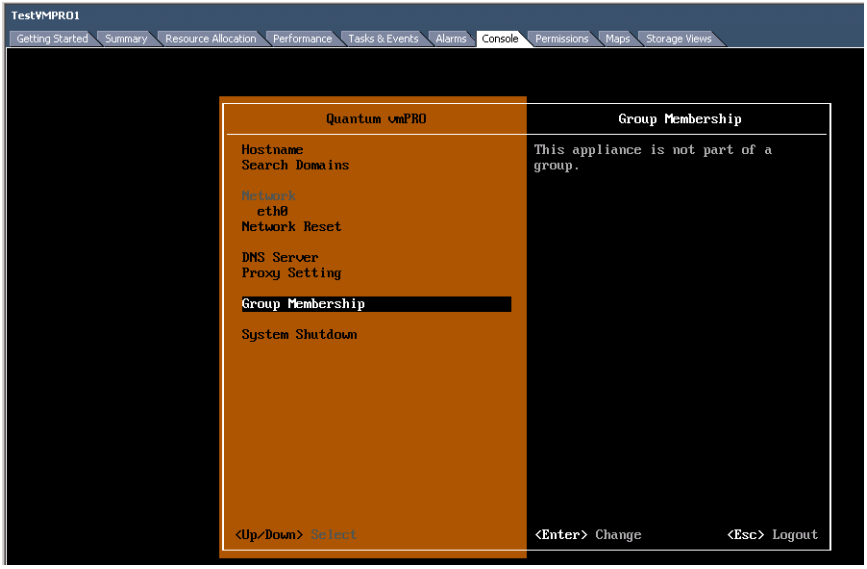
To set up groups, configure a Quantum vmPRO appliance as the group's master, and then add appliances to the group.

Groups are created using the console **Setup** wizard. See Access Quantum vmPRO on page 25 for information on accessing and using the console **Setup** wizard.

Create the Group's Master

1. Log into to the console **Setup** wizard for the Quantum vmPRO appliance that will be your group's master.
2. Select **Group Membership** (see Figure 135).

Figure 135 Group Membership



3. Press **<Enter>** to go to the **Change Group Membership** screen. (If an appliance is already configured as a master appliance, you will not be able to go to the **Change** screen, because no changes can be

made to a master's group membership until all its members have been removed.)

4 On the **Change Group Membership** screen, select **Create a new group** (use the arrow keys to move the cursor to **Create** and then press the spacebar) (see Figure 136).

Figure 136 Creating a New Group

5 Press **<Enter>** to save the change, and the group will be created with the current Quantum vmPRO appliance as the master. You can now add other Quantum vmPRO appliances to the group.

Add Quantum vmPRO Appliances to a Group

1 Log into the console **Setup** wizard for a Quantum appliance you want to make a member of a group.

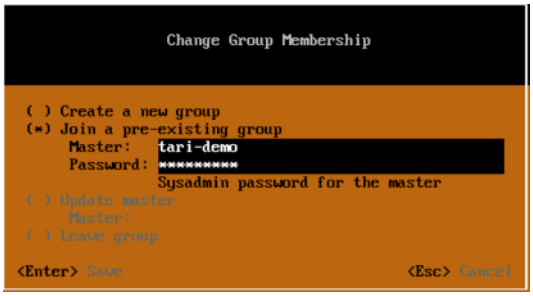
2 Select **Group Membership** and press **<Enter>** to go to the **Change Group Membership** screen.

3 At the **Change Group Membership** screen, select **Join a pre-existing group**.

4 Enter the IP address or resolvable hostname for the Quantum vmPRO appliance that is the master of the group in which you want to place the current appliance.

5 Enter the **sysadmin** password for the master appliance (see Figure 137).

Figure 137 Joining an Existing Group



6 Press **<Enter>** to save the changes, and the Quantum vmPRO appliance will join the specified group.

Remove a Quantum vmPRO Appliance From a Group

Note: When an appliance is removed from a group, the link between the backup policy and the storage no longer exists. For any node appliances which have left a group, you must re-create the backup policy. Also, if the appliance will be used as a standalone appliance, it will need a valid license.

1 Log into the **Setup** console for the Quantum vmPRO appliance to be removed from the group.

2 Select **Group Membership**.

3 From the **Change Group Membership** screen, select **Leave group**.

4 Save the changes.

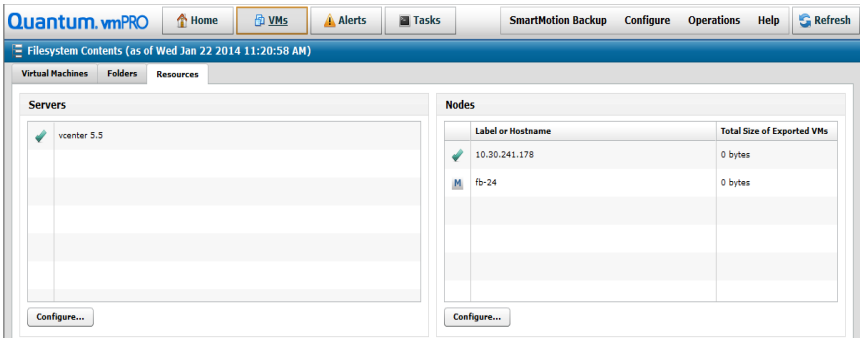
Note: You cannot remove a master appliance from a group unless all other appliances have already been removed from the group.

Manage Groups

Once you have created a master and added appliances to it, you must configure and manage all group members from the master appliance. If you go to the GUI for a group member that is not a master, you will see a warning reminding you to go to the group's master appliance to manage all appliances in the group. The warning includes a **Go to master** button that will take you to the GUI for the master appliance. Quantum does not support configuring a node appliance independently of its master.

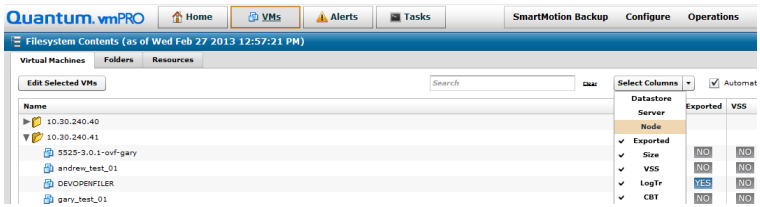
You can see the list of nodes on the **Resources** screen of the master appliance's **VMs** tab. (see Figure 138).

Figure 138 Lists of Nodes



On the VMs table, accessed by selecting **VMs** on the vmPRO GUI and then selecting the **Virtual Machines** tab, you can add a **Node** column so that you can see which node each VM is associated with. Open the **Select Columns** drop-down list and check **Node** (see Figure 139).

Figure 139 Adding a Node Column



Increase Backup Throughput

Increasing the number of nodes and correctly selecting VMs to be backed up by each node can increase overall backup throughput.

To select or change the node to which VMs are assigned, do the following:

1. From the Quantum vmPRO GUI, select **VMs**.
2. At the VMs screen, select the **Virtual Machines** tab.
3. From the VMs table, select one or more VMs whose node you want to select or change. You may need to open a folder (by selecting it) to access the VMs.

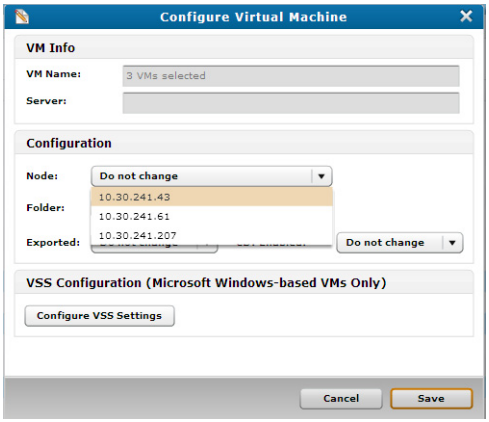
- To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you need to select.
- If you need to select all the VMs in a folder, select the folder.

4 Select **Edit Selected VMs** above the VM list.

5 In the **Configure Virtual Machine** dialog box, select the appropriate node from the **Node** drop-down list (see Figure 140).

6 Select **Save**.

Figure 140 Selecting a Node



Update Group Members When the Master's IP Address/ Hostname Changes

If a master appliance's hostname or IP address changes (in other words, the command `net set hostname` was run on the master), the appliances in the group must be updated and restarted. Both operations are performed from the Quantum vmPRO command line. See Access Quantum vmPRO on page 25 for information on accessing the Quantum vmPRO appliance's command line.

1 Update the group member appliance to the master appliance's new IP address/hostname using this command:

```
group update master <master>
```

The `group update master` command assumes that the master is the same appliance but with a new IP address. The command

should not be used in any other circumstance. After you run `net set hostname` on a master appliance, you will see a reminder to run `group update master` on the appliances in the group.

2 Restart the Quantum vmPRO appliance using this command:

```
system reboot
```

Import the Configuration Settings for Groups

This procedure will allow you to transfer the configuration settings of all the members of a vmPRO group (master and all nodes) to new appliances and have the new group function as the original did.

Note: Only the configuration settings of the previous/old group's master vmPRO appliance needs to be saved.

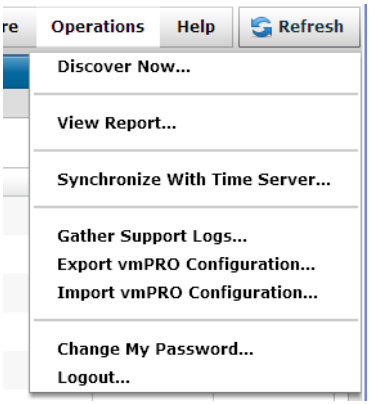
1 Save the previous/old master appliance's configuration settings: From the previous/old master appliance's vmPRO GUI, select **Export vmPRO Configuration** from the **Operations** drop-down list (see Figure 141).

Note: Remember the file name and its location when you download it.

2 Import the master configuration package to the new factory default appliance: From the new appliance's vmPRO GUI, select **Import vmPRO Configuration** from the **Operations** drop-down list (see Figure 141). Use the **Browse** button to locate and select the file you downloaded in the previous step. This appliance will be the new master.

Note: The importing of a saved/exported configuration package of a master appliance will automatically create a new master appliance.

Figure 141 Operations drop-down list



3 For each node that needs to be recovered, deploy a new appliance. Follow the procedure as presented in the online Quantum vmPRO Download and Installation Guide to deploy each new appliance.

Note: You will need a valid e-mail address and password to access the *vmPRO Download and Installation Guide*.

4 For each node, access its console Setup wizard and join the group; see Add Quantum vmPRO Appliances to a Group on page 138.

5 Manually reassign the VMs from the old nodes to the new nodes:

a From the master appliance's vmPRO GUI, select **VMs**.

b At the VMs screen, select the **Virtual Machines** tab (see Figure 145).

c From the VMs table, select the VMs that are to be reassign. You can also type **node:<node_name>** in the search field to help you find the VMs.
You may need to open a folder (by selecting it) to access the VMs.

- To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you need to select.
- If you need to reassign all the VMs in a folder, select the folder.

d Select **Edit Selected VMs**.

e On the **Configure Virtual Machine** dialog box, select the appropriate node from the **Node** drop-down list, and then select **Save** (see Figure 140).

6 Remove the old nodes:

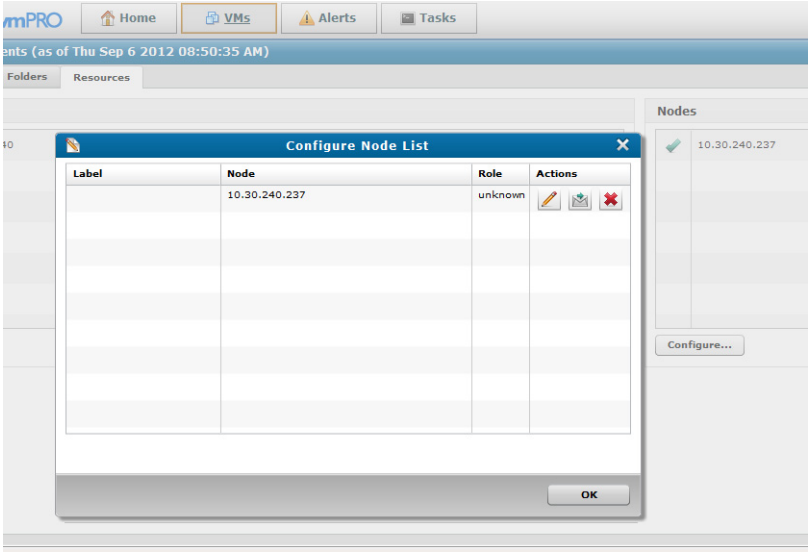
a From the master appliance's vmPRO GUI, select **VMs**.

b At the VMs screen, select the **Resources** tab.

c Under the **Nodes** pane, select **Configure**.

d On the **Configure Nodes List** dialog box, select the (red) **X** for each node that you want to remove (see Figure 142). (This will avoid the confusion of having *orphaned* nodes.)

Figure 142 Remove the Old Nodes



7 Reboot all nodes using the VMware vSphere console or from the each appliance's command console using the command **system reboot**.

Create and Manage Folders

Folders are a powerful construct within the appliance. They enable you not only to organize your VMs visually, but also to manage multiple Differential CBT backup rotation schedules, and the distribution of backup jobs across multiple appliance nodes. The CBT feature enables differential backups which significantly reduce the amount of data read from the hypervisor and written to the target storage; thus, reducing backup times.

By default, the appliance organizes your VMs in folders named for their respective vSphere ESX hosts. These folders are separate from your existing folder structures inside vSphere, and they are used in the appliance to allow you to refine and optimize the backup loads across your appliances.

If you add a vCenter server, your VMs will all appear in a single initial folder with the name of that vCenter server. Alternately if you add one or more ESX servers, your VMs appear in folders corresponding to the ESX host on which they reside.

You can create additional folders to visually organize your VMs and to manage multiple backup policies which will facilitate higher throughput. If you are using Group Mode, folders that you create on the master appliance will appear on all node appliances.

Use the following to help you set up your folders:

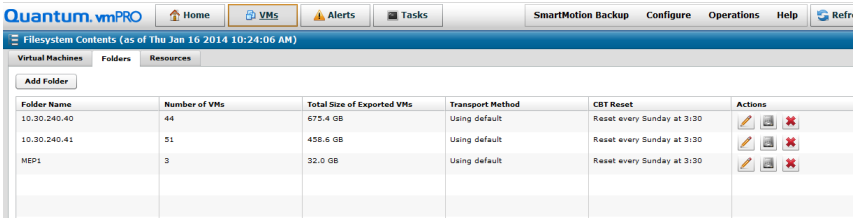
- Add folders and divide your VMs among them to enable multiple backup rotation policies.
- Define folders that reflect your organization's needs. For example, name folders and group VMs according to backup schedules or classes of VMs such as Production, QA, and Development.
- Stagger full backups across different weeks to shorten long full backup windows.
- Assign folders and VMs to be managed by the different appliance nodes in a group to distribute the backup load.
- VMs can belong to only one folder; however, a folder can be backed up by more than one policy, which in turn allows it to have multiple schedules.

Create Folders

To create a folder, do the following:

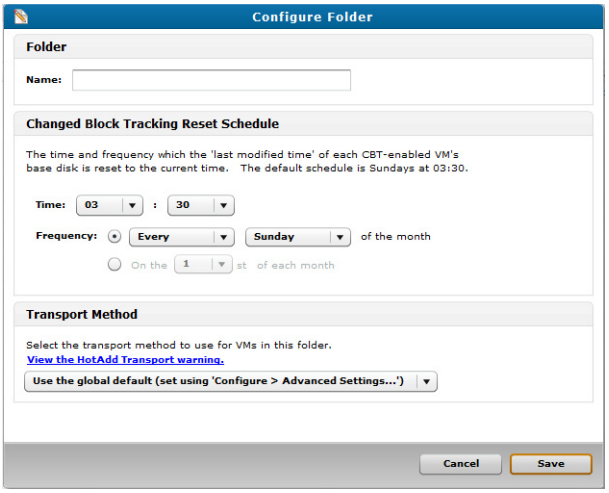
1. From the Quantum vmPRO GUI, select **VMs**. See Access Quantum vmPRO on page 25 for information on accessing the GUI.
2. At the VMs screen, select the **Folders** tab (see Figure 139).

Figure 143 Folders tab



3. On the **Folders** screen, select **Add Folder**.
4. In the **Configure Folder** dialog box, enter a name for the folder (see Figure 144).

Figure 144 Configure Folder



5. If you are using Changed Blocked Tracking on the VMs, you can change the CBT reset schedule for the folder if you wish. Keep in mind that setting, or re-setting, the CBT schedule sets the time at which the next full backup will occur. See vSphere Changed Block Tracking (CBT) Support on page 161 for more information.

6 Select your **Transport Method**: global default, HotAdd with fall back to NBD, or NBD only.

> **Note:** If you want to use HotAdd as your **Transport Method**, please read the warning notice.

7 Select **Save**, and you will see the new folder appear in the list on the **Folders** tab.

8 Add as many folders as you need.

Move VMs to New Folders

To move VMs to a new folder, do the following:

1 From the Quantum vmPRO GUI, select **VMs**.

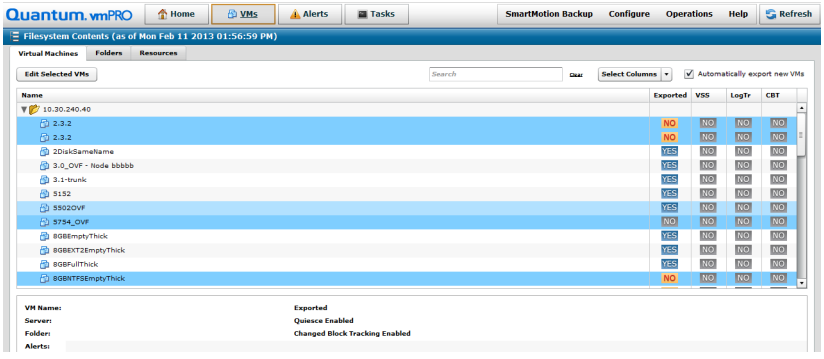
2 At the VMs screen, select the **Virtual Machines** tab.

3 From the VMs table, select one or more VMs to move into a new folder. You may need to open a folder (by selecting it) to access the VMs.

- To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you need to select.
- If you need to move all the VMs in a folder to the same new folder, simply select the folder icon.

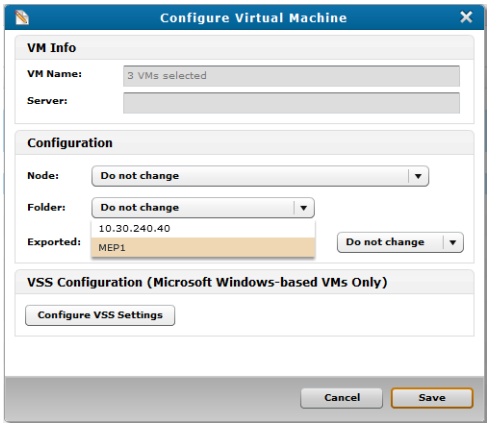
4 Select **Edit Selected VMs** above the VM list (see Figure 145).

Figure 145 Selecting VMs to Move



5 In the **Configure Virtual Machine** dialog box, select the folder to move the VM or VMs to (see Figure 146).

Figure 146 Configure Virtual Machine



6 Select **Save**. You will return to the **Virtual Machines** tab, where you will see the VMs listed in their new folders.

Edit or Delete a Folder

To edit a folder, select **VMs** on the Quantum vmPRO GUI, and then select the **Folders** tab. In the **Actions** column, select the folder's Edit folder (pencil) icon. Make the appropriate changes, and then select **Save**.

To delete a folder, select **VMs** on the Quantum vmPRO GUI, and then select the **Folders** tab. In the **Actions** column, select the folder's Delete folder icon (red **X**).

Note: A folder must be empty before it can be deleted. If the folder contains any VMs, you must move all the VMs from that folder to another folder.

Chapter 6

Quantum vmPRO Advanced Use

This chapter describes advanced features of Quantum vmPRO and contains the following sections:

- Quantum VSS Writer
- Embed the Quantum vmPRO GUI in vSphere Client
- Quantum vmPRO Support for External Monitoring
- Synchronize With the Time Server
- vSphere Changed Block Tracking (CBT) Support
- Configure Advanced Settings

Quantum VSS Writer

The VSS Writer prepares Windows for a VMware snapshot and automates a non-authoritative restore of Windows Domain Controller when the virtual machine is restored. When restoring a Windows Active Directory Domain Controller from a snapshot image, Quantum automatically boots the VM in the restore mode and performs the necessary steps to prevent a “USN rollback” so that directory replication will work correctly.

Quantum vmPRO supports application-consistent quiescing of Windows 2003 32bit/64bit, Windows 2008 32bit/64bit, Windows 2008 R2, and Windows 2012. Quantum's VSS Writer supports automating non-authoritative recovery of Active Directory, Exchange 2007, Exchange 2010, Windows Server 2012, SQL Server 2008, and SQL Server 2012 from the snapshot.

Note: Before beginning a VSS backup, ensure that the VM has enough free disk space. VSS backups will fail when the VM is low on free disk space. For more information, see http://technet.microsoft.com/en-us/library/cc708051(v=ws.10).aspx.

Note: VSS requires VMware Tools to be up to date.

Requirements for Active Directory Backup and Recover Support

- Windows Server 2003 and above
- VMware tools (latest build preferred)
- The Quantum VSS Writer
- Enabled Quiesce on VMs

Manual Installation of the Quantum VSS Writer

The installation takes place from the Windows system upon which you are installing the VSS writer.

The Quantum VSS Writer must be installed on each system that is to have this advanced level of support.

The manual installation method allows you to install the VSS writer without exposing the Window's username and password, which are required when using the automatic method as shown in Figure 149.

To install the Quantum VSS agent, do the following:

1. Download the appropriate version of **QuantumVSS.exe** from **\\<vmPRO IP>\quantum-support\vss**.

   In this share you will see two folders, **2003** and **2008 and higher**. In the **2003** folder you will find the **QuantumVSS.exe** that supports Windows 2003. In the **2008 and higher** folder there are two sub folders, **32bit** and **64bit**, each has a **QuantumVSS.exe** that supports Windows 2008 32 or 64 bit servers respectively.

2 Install the correct Quantum VSS on the Windows VM by double clicking the **QuantumVSS.exe** file and following the instructions.

Enable Quiesce for VMs

For file system consistency, you must first enable quiesce. See Access Quantum vmPRO on page 25 if you need information on accessing the vmPRO GUI.

1 From the Quantum vmPRO GUI, select **VMs**.

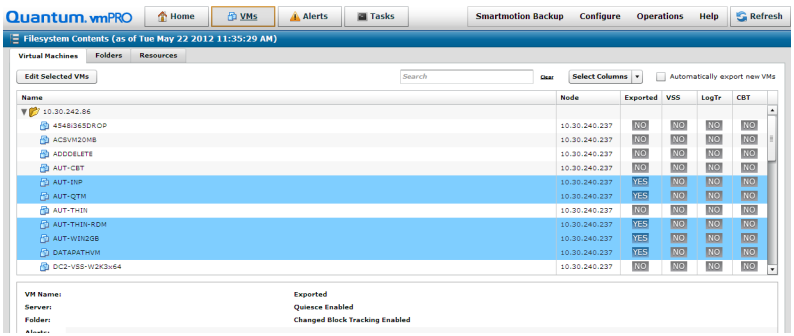
2 From the **VMs** screen, select the **Virtual Machines** tab.

3 In the VM table on the **Virtual Machines** tab, select the VM or VMs for which you need to enable Quiesce (see Figure 147).

- To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you need to select.
- You can select a folder to edit all the VMs in that folder.

  By default, all your VMs are in a single folder, named for their vCenter or ESX server, but you can create more folders and move VMs into them to facilitate VM management (see Create and Manage Folders on page 145).

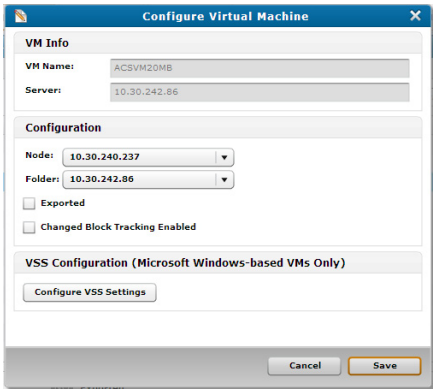
Figure 147 Selecting VMs to Enable For Quiesce



4 Select **Edit Selected VMs**.

5 In the **Configure Virtual Machine** dialog box, check **Configure VSS Settings** (see Figure 148). The **Configure VSS Login** dialog box displays.

Figure 148 Configure Virtual Machine



6 From the **Configure VSS Login** dialog box, select **Quiesce Enabled (requires VMware tools)** if you have selected one VM to quiesce; select **Yes** in the **Quiesce Enabled** drop-down list if you have selected multiple VMs to quiesce (see Figure 149).

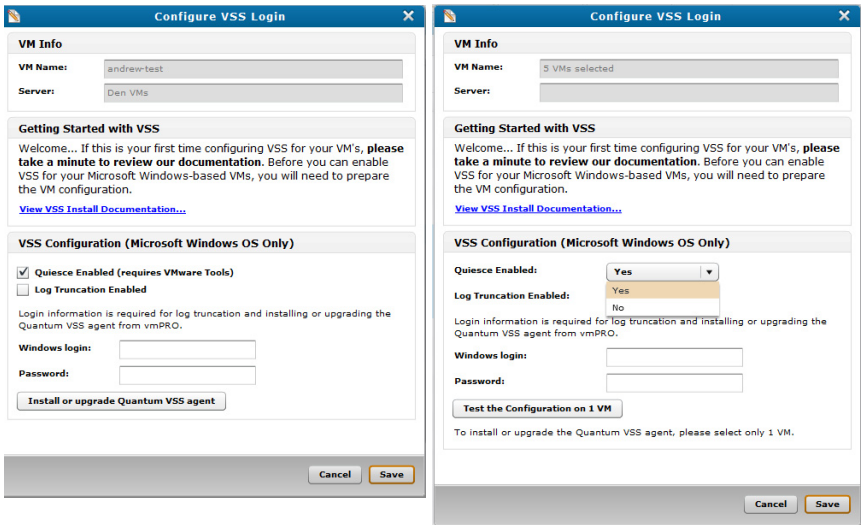
If necessary, Log truncation can be enabled at this time by selecting **Log Truncation Enabled** and providing the login credential for the VM. Log Truncation allows the vmPRO to trigger transaction log truncation after a backup completes. Failure to handle the truncation of the log files can cause a system disk or partition to become full, which will lead to application downtime.

If Log Truncation is enabled for VMs that are being backed up by SmartMotion, the log truncation will occur automatically when SmartMotion completes successfully. If the VM is being copied from **/export** manually or through a third party backup tool, you will need to manually trigger the log truncation when the backup completes. You can do this using the button labeled **Complete Backup (VSS)** on the Virtual Machines tab of the GUI, or by using the console commands (see vss on page 185).

Note: The **Complete Backup (VSS)** button will not display unless there are VMs with log truncation enabled that have been backed up recently. It can take up to an hour after the backup starts for the button to display.

7 You can automatically install or upgrade the VSS writer by entering the Window's username and password and then clicking **Install or upgrade Quantum VSS agent** (optional).

Figure 149 Enable Quiesce

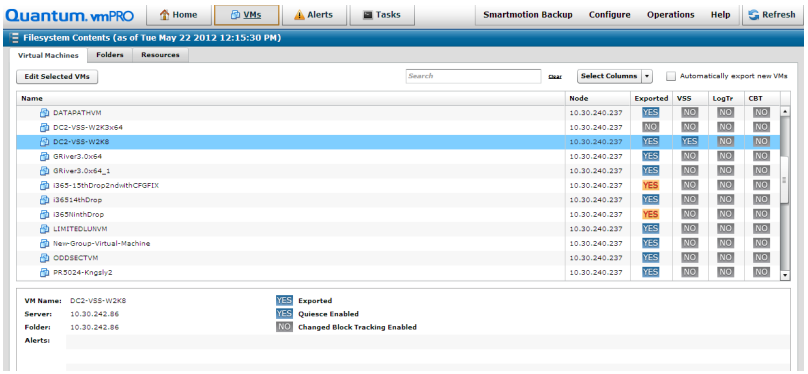

Configure VSS Login
VM Info
VM Name:
andrew-test
Server:
Den VMs
Getting Started with VSS
Welcome... If this is your first time configuring VSS for your VM's, please take a minute to review our documentation. Before you can enable VSS for your Microsoft Windows-based VMs, you will need to prepare the VM configuration.
View VSS Install Documentation...
VSS Configuration (Microsoft Windows OS Only)
Quiesce Enabled (requires VMware Tools)
Log Truncation Enabled
Login information is required for log truncation and installing or upgrading the Quantum VSS agent from vmPRO.
Windows login:
Password:
Install or upgrade Quantum VSS agent
Cancel
Save
Configure VSS Login
VM Info
VM Name:
5 VMs selected
Server:
Getting Started with VSS
Welcome... If this is your first time configuring VSS for your VM's, please take a minute to review our documentation. Before you can enable VSS for your Microsoft Windows-based VMs, you will need to prepare the VM configuration.
View VSS Install Documentation...
VSS Configuration (Microsoft Windows OS Only)
Quiesce Enabled:
Yes
Yes
No
Log Truncation Enabled:
Login information is required for log truncation and installing or upgrading the Quantum VSS agent from vmPRO.
Windows login:
Password:
Test the Configuration on 1 VM
To install or upgrade the Quantum VSS agent, please select only 1 VM.
Cancel
Save

8 Select **Save**. If you configure a large number of VMs, the process may take some time.

9 When the process is finished, you can view your changes in the VMs table (see Figure 150).

- The **VSS** column on the Virtual Machines tab shows whether Quiesce is enabled for each VM.
- If you do not see a **VSS** column, you can select the **Select Columns** drop-down list to add the column.
- When you select a single VM, you will see further details about that VM at the bottom of the table.

Figure 150 VMs List (Quiesce Enabled)



VMware Tools Out of Date

VSS requires VMware tools to be up to date. If VSS (quiesce) is enabled on a VM and its VMware Tools is out of date, the issue will be reported in the Quantum vmPRO GUI.

- On the **Virtual Machines** tab of the **Home** page, the VM's **YES** in the VSS column will be red.
- If you mouse over a VM that has a red **YES**, you will see an error message.
- You will also receive alert messages if VMware Tools is out of date for any VM's. If cleared, the alert message will reappear every 15 minutes until you update VMware Tools and perform a discover, or disable VSS (Quiesce) for the VMs.

Uninstall the VSS Writer

Use the Windows Control Panel **Add/Remove Programs** to uninstall the VSS Writer.

If you encounter an error using the Windows' **Add/Remove Programs** to uninstall the VSS Writer, do the following:

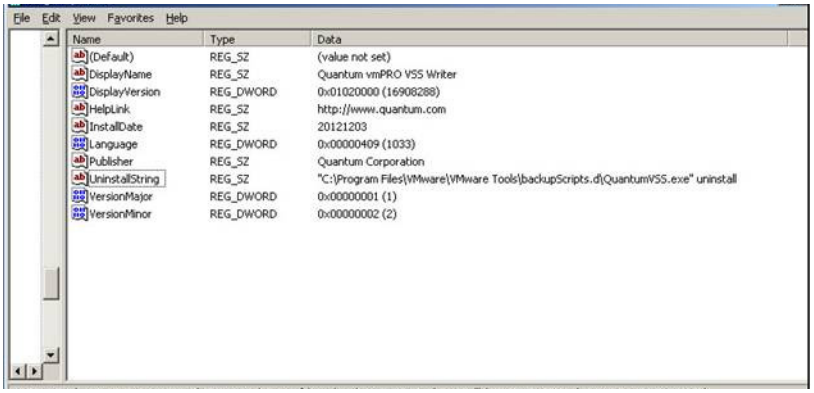
1. On the Windows VM, open the Registry Editor by selecting **Run** from the Windows' start button.
2. In the **Run** dialog box, enter **regedit**, and then click **OK**.
3. Navigate to the following key:

```
HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Uninstall\{13C110B5-F313-4bc5-B700-D7B4B6A70A49}
```

4. Change the value of **UninstallString** to the following, including the quotes (see Figure 151):

```
"C:\Program Files\VMware\VMware Tools\backupScripts.d\QuantumVSS.exe" uninstall
```

Figure 151 Regedit Uninstall


File Edit View Favorites Help
Name Type Data
(Default) REG_SZ (value not set)
DisplayName REG_SZ Quantum vmPRO VSS Writer
DisplayVersion REG_DWORD 0x01020000 (16908288)
HelpLink REG_SZ http://www.quantum.com
InstallDate REG_SZ 20121203
Language REG_DWORD 0x00000409 (1033)
Publisher REG_SZ Quantum Corporation
UninstallString REG_SZ "C:\Program Files\VMware\VMware Tools\backupScripts.d\QuantumVSS.exe" uninstall
VersionMajor REG_DWORD 0x00000001 (1)
VersionMinor REG_DWORD 0x00000002 (2)

Note: If the Program Files directory is not located at **C:\Program Files**, you will need to replace that portion with the actual location.

5 Return to **Add/Remove Programs** and attempt the uninstall again.

VSS Resources

Information about what VMware tools can (and cannot) do with VSS:

- Working with Microsoft Volume Shadow Copy

Information about Active directory recover:

- How to detect and recover from a USN rollback in Windows Server 2003
- Active Directory Backup and Restore

Embed the Quantum vmPRO GUI in vSphere Client

The Quantum vmPRO GUI can be embedded directly into vSphere Client when it is connected to a vCenter Server. To use this feature, a Quantum plugin must be registered with the vCenter server.

Note: The vCenter plugin works with all versions of the native vSphere client, but currently there is no plugin for the vSphere Web client.

Register the vCenter Plugin

Register the plugin from the Quantum vmPRO GUI (see Access Quantum vmPRO on page 25).

1. From the **Configure** drop-down list, select **Config Wizard**.
2. From the **Configuration Wizard** welcome screen, select **vCenter Plugin** (see Figure 152).

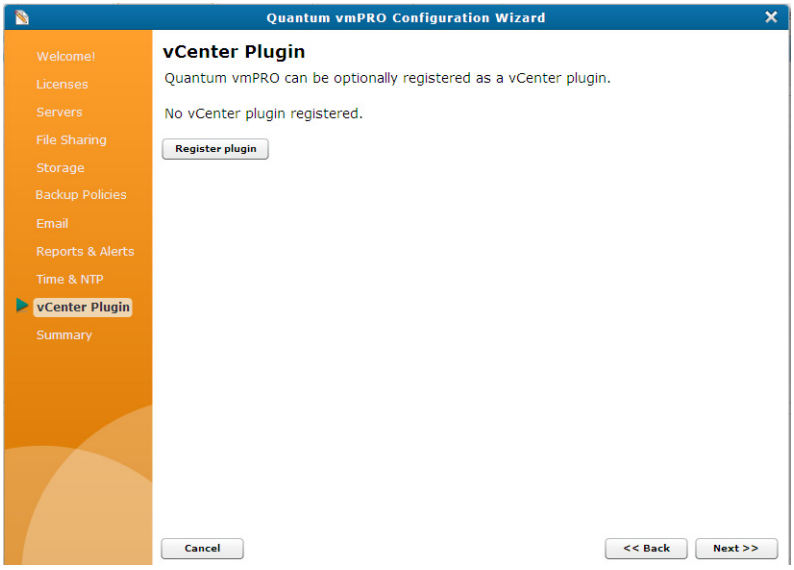


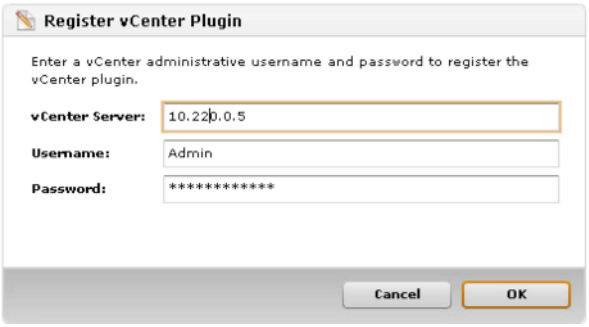
Figure 152 Configuration Wizard: vCenter Plugin

3. Select **Register plugin**.
4. In the **Register vCenter Plugin** form, enter the IP address or resolvable hostname of your vCenter server.

Note: If you need to register your vCenter plugin using an alternate port, enter the IP address and port number using the following format: **<IP_address:port_number>**.

5. Enter the administrative username and password (see Figure 153).

Figure 153 Register vCenter Plugin



6 Select **OK** and the plugin will be registered with the vCenter server.

7 From the **Configuration Wizard**, select **Summary** to go to the summary screen.

8 Select **Save**, then **Next**, then **Finish** to make your changes permanent.

You can return to the **Configuration Wizard** if you need to remove the plugin from the vCenter server.

Use the vCenter Plugin Once It Has Been Registered

To use the vCenter plugin, do the following:

1 Restart your vCenter server.

2 Log into your vSphere client.

3 Select a datacenter or datacenter folder from the Inventory view.

4 Select the new tab labeled **Quantum vmPRO <IP address>**, and the Quantum vmPRO GUI will load in the tab. (A window may appear asking whether you want to trust the security certificate; select **Yes**.) You can then log into the GUI as usual.

Note: If the Quantum vmPRO GUI does not load, make sure Adobe Flash Player is installed on the system running the vSphere Client.

Quantum vmPRO Support for External Monitoring

Quantum vmPRO supports external read-only monitoring using SNMP Version 2c. Quantum vmPRO supports MIB-II.

Quantum vmPRO also supports Nagios remote plugin execution using the NRPE add-on. This allows you to monitor aspects of the Quantum vmPRO appliance using an external Nagios application.

SNMP Support

Quantum vmPRO supports external read-only monitoring using SNMP Version 2c. Quantum vmPRO supports MIB-II.

SNMP allows access to any object in the system branch of the tree. SNMP, which is not enabled by default, can be configured from the command line of the Quantum vmPRO appliance. For a list of vmPRO supported SNMP commands, see snmp on page 182.

For more information regarding various system statistics, you can read following MIBs:

Table 2 SNMP MIBs

MIB	Description
.1.3.6.1.4.1.2021.4	Memory
.1.3.6.1.4.1.2021.9	Disks (/, /var, and /var/cores only)
.1.3.6.1.4.1.2021.10	Load
.1.3.6.1.4.1.2021.11	CPU
.1.3.6.1.2.1.1	System info such as uptime
.1.3.6.1.2.1.2.0.0.0.2	Interfaces (eth0 only)
.1.3.6.1.2.1.4	Networking

Nagios Support

Quantum vmPRO supports Nagios remote plugin execution using the NRPE add-on. This allows you to monitor aspects of the Quantum vmPRO appliance using an external Nagios application.

Monitoring commands are executed from the external Nagios application using the **check_nrpe** plugin with arguments to specify the host address and command:

```
check_nrpe -H <Quantum vmPRO appliance address> -c
<command>
```

Table 3 lists the supported commands.

Table 3 Nagios Commands

Command	Description
`check_disk`	Check the disk space on the appliance file system
`check_load`	Check the system load average over the last 1, 5 and 15 minutes
`check_snmp`	Check the status of snmp on the appliance

Table 4 lists commands that are used from the Quantum vmPRO console command line (see Access Quantum vmPRO on page 25 for information on accessing the command line):

Table 4 Nagios Console Commands

Command	Description
`nagios disable`	Disable Nagios on the appliance
`nagios enable`	Enable Nagios on the appliance
`nagios status`	Check status of Nagios

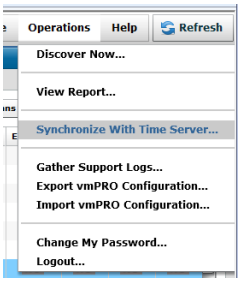
For more information about Nagios, see: www.nagios.org

Synchronize With the Time Server

Synchronize your appliance with the time server using the Quantum vmPRO GUI (see Access Quantum vmPRO on page 25 if you need information on the GUI).

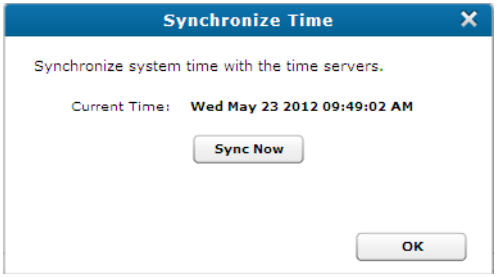
1 From the **Operations** drop-down list in the Quantum vmPRO GUI, select **Synchronize With Time Server** (see Figure 154).

Figure 154 Synchronize With Time Server



2 In the **Synchronize Time** dialog, select **Sync now** (see Figure 155).

Figure 155 Synchronize Time Dialog



3 When the synchronization is complete, you'll see a finished message, and you can select **OK** to dismiss the dialog box.

vSphere Changed Block Tracking (CBT) Support

The appliance's SmartRead and SmartMotion capabilities can leverage VMware's Changed Block Tracking (CBT) feature to identify the virtual disk blocks that have changed, allowing backup and storage processes to avoid unnecessary reads. CBT allows the vmPRO to backup VMs at a differential level; thus, reducing network I/O and allowing backups to finish faster because only the changes to the virtual machine's disk(s) are backed up.This provides the basis for the appliance's differential backup capability. The CBT feature in VMware ESX versions 4.0 update 2 and later has been integrated with Quantum vmPRO.

When the CBT feature is enabled for a VM, the Quantum vmPRO appliance will create a **pancbt** file for each base disk (**-flat.vmdk** file) in the **/export** file system. The **pancbt** files contain the changed blocks for their corresponding base disk. The differential CBT backup files (designated with the **–pancbt.vmdk** suffix) are not complete **.vmdk** disk images. These differential CBT backup files require recovery through the appliance before they can be used. The base disk's mod time will be the start of the reset time, while the **pancbt** files will have newer mod times. (See the section, Schedule Your Changed Block Tracking Resets on page 164, for the default reset schedule and instructions for selecting a different schedule.)

Note: Only paid versions of VMware ESX or ESXi servers should be used. Free versions have various API limitations that prohibit vmPRO from functioning as designed.

CBT Considerations

When using CBT, keep the following in mind:

- VMs must be at virtual hardware version 7 or above for CBT.
- The ESX server must be version 4.0 update 2 or above.
- Assumes differential backups.
- If you are using ESX 4.1, reverting a snapshot resets CBT for that VM. You must then remove all snapshots from the appliance and run the console command `cbt reset <hypervisor> <VM>`.

- Moving a VM with Storage vMotion disables CBT. Standard vMotion (i.e., when the vmdk stays in the same physical place and only the ESX host changes) does *not* disable CBT.
- Using vMotion on VMs for load balancing during a backup can cause the backup to fail to complete. To avoid this issue, vMotion will be disabled on the VMs prior to the start of the backup process on vmPRO 3.0.1 and newer. This feature is supported by vCenter Server version 5. For vCenter 4.x, the administrator should configure the VMs so that vMotion will not run during the backup.
- Multiple appliances cannot manage the same VM when the CBT feature is used on the VM.
- Do not schedule CBT resets to occur at the same time as backups. It is recommended that CBT resets be scheduled hours before the start of your backup window to allow enough time for the reset on all CBT-enabled VMs to complete before your backups start.

  Note: The backup after a CBT reset is a full backup.

- Activating or deactivating the CBT feature will trigger the immediate creation and removal of an ESX snapshot for each VM activated, this is required by the VMware API.

  Note: The removal and creation of a snapshot for each VM can be a time consuming process when activating or deactivating the CBT feature on multiple VMs.

- Differential CBT backup files are designated with the -pancbt.vmdk suffix. Unlike a Full backup, these files are not complete. VMware expects .vmdk files to be complete images, thus CBT-based backups require recovery through the vmPRO Recovery Wizard before being usable to ESX.

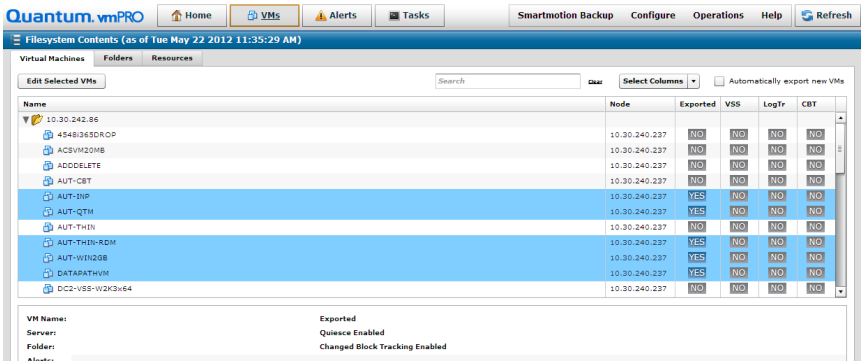
Enable CBT for VMs

Enable CBT for VMs from the Quantum vmPRO GUI (see Access Quantum vmPRO on page 25 if you need information on the GUI).

1. From the Quantum vmPRO GUI, select **VMs.**
2. Select the **Virtual Machines** tab.
3. In the table on the **Virtual Machines** tab, select the VM or VMs for which you need to enable CBT (see Figure 156).

- To select consecutive VMs in the list, select the first VM in the series, hold down **<Shift>** and select the last VM in the series.
- To select non-consecutive VMs, hold down **<Ctrl>** and select each VM you need to select.
- To set the CBT setting for all VMs in a folder, select the folder.

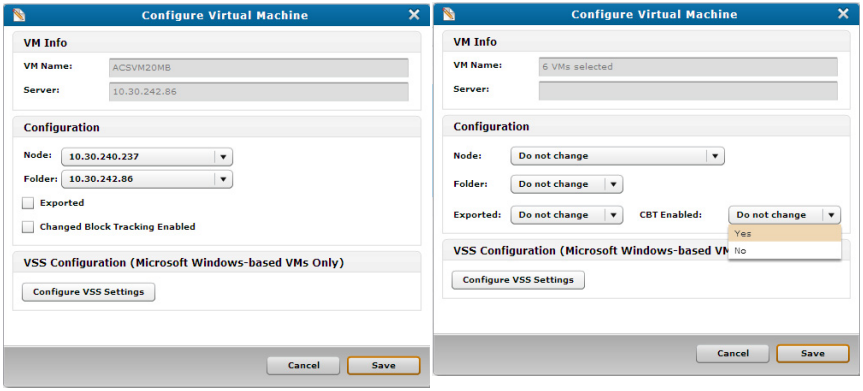
Figure 156 Selecting VMs to Enable For CBT



4 Select **Edit Selected VMs**.

5 In the **Configure Virtual Machine** dialog box, check **Changed Block Tracking Enabled**, or, if you are configuring a folder or a group of VMs, select **Yes** from the **CBT Enabled** drop-down list (see Figure 157).

Figure 157 Configure Virtual Machine

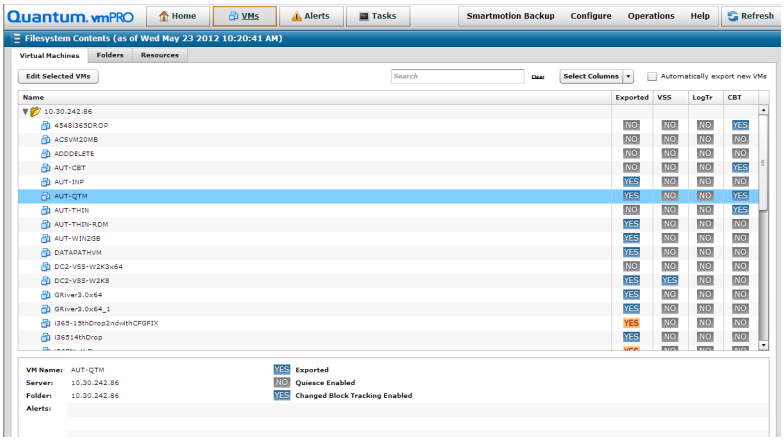


6 Select **Save**.

7 Once your changes are completed, view them in the **CBT** column on the **Virtual Machines** tab (see Figure 158).

- If you do not have a **CBT** column, you can add it from the **Select Columns** drop-down list.
- You can view more details for a particular VM by selecting the VM from the list on the **Virtual Machines** tab and looking at the detailed view below the table.

Figure 158 VMs List (CBT Enabled)



Schedule Your Changed Block Tracking Resets

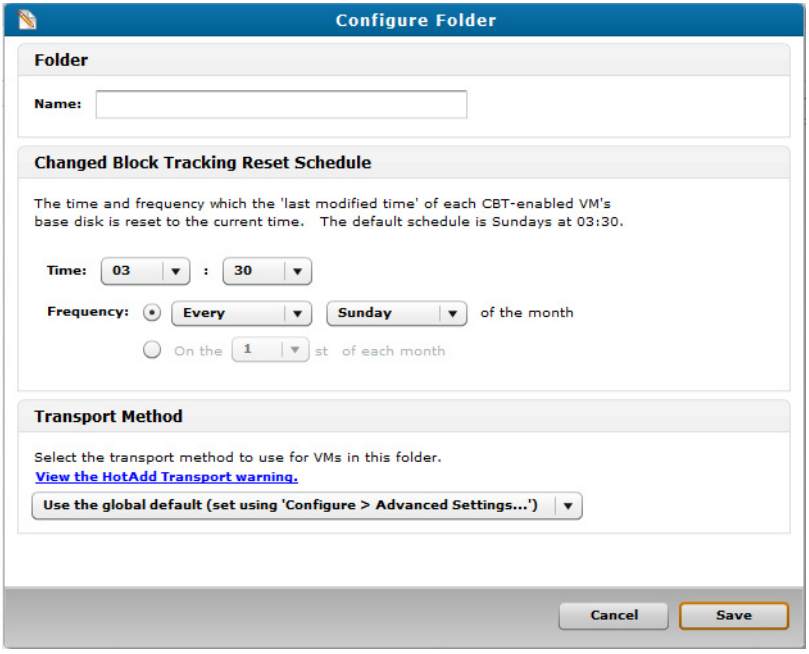
By default, the last modified time for each CBT-enabled VM's base disk is reset to the current time each Sunday at 03:30. You can modify this schedule in the configuration of the folder containing the VMs. Keep in mind that setting, or re-setting, the CBT schedule sets the time at which the next full backup will occur.

To do so, go to the Quantum vmPRO GUI and select **VMs**. Then select the **Folders** tab. Select the pencil icon for the folder whose CBT reset schedule you need to change, select the time and frequency for your resets, and select **Save** (see Figure 159).

Note: See Create and Manage Folders on page 145 for more details about creating and managing folders.

Note: Do not start your resets at the same time as your backups. We recommend scheduling your resets a few hours before your backups to ensure that all CBT-enabled VMs have been reset before backups begin.

Figure 159 Scheduling CBT Resets


Configure Folder
Folder
Name:
Changed Block Tracking Reset Schedule
The time and frequency which the 'last modified time' of each CBT-enabled VM's base disk is reset to the current time. The default schedule is Sundays at 03:30.
Time: 03 : 30
Frequency: Every Sunday of the month
On the 1 st of each month
Transport Method
Select the transport method to use for VMs in this folder.
View the HotAdd Transport warning.
Use the global default (set using 'Configure > Advanced Settings...')
Cancel
Save

For a one-time, immediate reset of the last modified time for the base disk, use the following console command:

```
cbt reset [all | <hypervisor> <vm name> | folder <folder>
```

The last modified time will be reset to the current time.

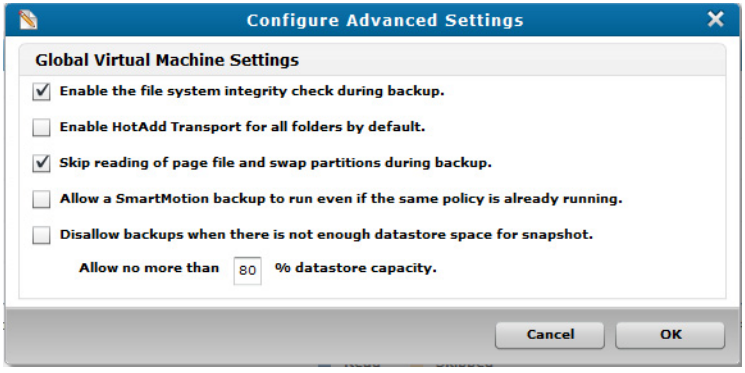
Configure Advanced Settings

This section provides information regarding the advanced settings for the Quantum vmPRO. These options are found on the **Configure Advanced Settings** dialog box (see Figure 160).

From the vmPRO GUI, select **Configure > Advanced Settings**.

- Enable the file system integrity check during backup
- Enable HotAdd Transport (Use caution when enabling this feature.)
- Skip reading of page file and swap partitions during backup
- Allow a SmartMotion to run even if the same policy is already running
- Disallow backups when there is not enough datastore space for snapshot

Figure 160 Configure Advanced Settings


Configure Advanced Settings
Global Virtual Machine Settings
Enable the file system integrity check during backup.
Enable HotAdd Transport for all folders by default.
Skip reading of page file and swap partitions during backup.
Allow a SmartMotion backup to run even if the same policy is already running.
Disallow backups when there is not enough datastore space for snapshot.
Allow no more than 80 % datastore capacity.
Cancel
OK

Enable the file system integrity check during backup

Clear or select the **Enable the file system integrity check during backup** option in the **Configure Advanced Settings** dialog box.

This option allows the vmPRO to execute a file systems integrity check on the VM's disks before performing a backup of that VM. This ensures that the SmartRead optimization can be used during backup. Otherwise it cannot, and an alert will be issued about possible problems at recover time.

Enable HotAdd Transport

Clear or select the **Enable HotAdd Transport** option in the **Configure Advanced Settings** dialog box.

Caution: If the vmPRO appliance has HotAdd disks attached, DO NOT delete the vmPRO appliance from the server; this will result in the attached disks being deleted from the datastore. Because of the potential for data loss, the default configuration of the vmPRO enables the NBD transport mode — not the HotAdd transport mode.

vmPRO now supports vSphere's HotAdd and HotAdd transport features. HotAdd allows you to add and remove SCSI virtual hard disks while your vmPRO is running. SCSI HotAdd is a good way to get virtual disk data from guest virtual machines directly to the ESX/ESXi host on which they are running. HotAdd improves performance and provides a non-networked-based method of transferring data from the source VM to vmPRO for backup purposes.

Using HotAdd Mode

When a hypervisor is under moderate to heavy system load, Quantum tests have shown significant performance improvement for backup throughput when the HotAdd transport mode was used.

Before enabling the HotAdd transport mode, keep in mind that the HotAdd transport mode can access only the following VMs:

- Target VMs that are on the same ESX server as the vmPRO appliance.
- Target VMs that are managed by the same vCenter as the vmPRO, and sharing the same storage. In this case, the vmPRO must be managing the vCenter and not managing the ESX server directly. The vmPRO must also have access to the shared storage used by the target VM.

If neither of the above conditions is met, the transport method will automatically revert to NBD.

Verify HotAdd Mode in Use

Enabling HotAdd only requests the HotAdd transport mode. It does not guarantee it will be used. You should verify that the HotAdd transport mode is in use.

To verify that the HotAdd mode is in use, do any of the following:

- From your vmPRO GUI, select **Help > vmPRO System**.
  Select the **Log Files** tab.
  Select **datastore_fs**. Look for the message
  `Obtained (and using) Transport Mode:` hotadd.
- In your vSphere client, right click your vmPRO VM and select **Edit > Settings.** Select the **Hardware** tab and verify that a new virtual disk is added to the vmPRO each time a new disk is copied.

Limitation with Mismatched Block Size

HotAdd cannot be used if the VMFS block size of the datastore containing the virtual machine folder for the target (source of the backup) virtual machine does not match the VMFS block size of the datastore containing the proxy (The vmPRO appliance. The vmPRO is standing in as a proxy for the original VM that owns the disk.) virtual machine. For example, if you back up virtual disk on a datastore with 1MB blocks, the proxy must also be on a datastore with 1MB blocks.

To use the HotAdd feature, you must meet your version of vSphere's HotAdd licensing requirement (see Table 5).

Table 5 vSphere HotAdd Licensing

If your vSphere version is	then the SCSI HotAdd feature
5.1	is always available.
5.0	is enabled only for vSphere editions Enterprise and higher, which have HotAdd licensing enabled.
4.1	requires no special licensing.
4.0 update 2	requires an Advanced or higher license: Advanced, Enterprise, or Enterprise Plus.

Skip reading of page file and swap partitions during backup

Clear or select the **Skip reading of page file and swap partitions during backup** option in the **Configure Advanced Settings** dialog box.

This option improves upon the overall disk IO savings of SmartRead by implementing a mechanism to skip (avoid) reading blocks associated with temporary, transitional files of virtual machines. Examples of such files include virtual memory paging files and temporary files created during software installation. It reduces the backup window since these files are not being backed up. These temporary files are not required for a full system restore; hence, it is safe to skip them during a backup.

Allow a SmartMotion to run even if the same policy is already running

Clear or select **Allow a SmartMotion to run even if the same policy is already running** option in the **Configure Advanced Settings** dialog box.

This option will allow you to starting another scheduled backup of the same policy. This is not the preferred method for running backups and is not enabled by default. This option will (when enabled) allow you to start another backup immediately after a long running (more than 24 hours) backup has completed.

Disallow backups when there is not enough datastore space for snapshot

Clear or select **Disallow backups when there is not enough datastore space for snapshot** to have vmPRO display an alert and stop the backup when the datastore is at 80% (default, configurable) of its total accessible capacity.

Appendix A

Console Commands and vmPRO Procedures

The Appendix contains the following content:

- Console Commands
- Procedures

Console Commands

Most Quantum configuration and administration is performed via the Quantum vmPRO GUI or the Quantum vmPRO console wizard. A limited number of functions are available from the appliance's console command line. The preferred way to access the command line is by selecting the appliance in your vSphere client, selecting the Console tab, and exiting the console Setup wizard. See Access Quantum vmPRO on page 25 for more details.

At the command line, entering help lists all commands, and entering the first element of a command lists all commands that start with that element, such as **ssh** or **system**. For example:

```
quantum:bsmith> ssh
Showing commands that start with 'ssh':
   ssh disable
```

```
ssh enable
ssh status
```

Note that all network commands reflect the network related to the Quantum vmPRO virtual machine.

The commands are:

- autosupport
- cbt
- config
- filesys
- group
- help
- import
- log
- nagios
- net
- ntp
- nw
- smartmotion
- snmp
- ssh
- system
- tsm
- vss

autosupport

The **autosupport** commands gather log files and sends the package to the email address given in the command if SMTP mail is set up using the **Email** selection from the Quantum vmPRO GUI **Configure** drop-down list.

autosupport send logs [<email-address>]

Email support package.

autosupport upload logs [nocreate]

Upload support package to support site. **Nocreate** flag will not try to create a support package first.

autosupport upload report

autosupport set daily-upload-packages on|off

This command turns on or turns off the automatic uploading of support bundles when a core file is generated. This command does not change any of the **Configure Report & Alerts** settings.

cbt

The Changed Block Tracking (**cbt**) command is:

cbt reset [all] | [<hypervisor> <vm name> | folder <folder>]

Resets to the last modified time for the base disk to the current time. You can reset all VMs on the appliance, or specify an individual VM.

config

Configuration parameters should be modified using the Quantum vmPRO GUI.

config set date MM/DD/YYYY HH:MM[:SS]

Set the system date and time.

config set time zone <timezone>

Quantum vmPRO uses standard time zone names, such as US/Pacific, Asia/Tokyo, and Europe/Paris. A complete list of time zones is available on the Quantum Support site.

config create https-certificate

Create a new HTTPS SSL certificate.

Note: If you have the vmPRO GUI open in a browser, you will need to refresh the browser.

filesys

The **filesys** commands are:

filesys find <search-term> | vmx | vmdk

List known files and directories. With the vmx command argument, list every .vmx file. With the vmdk argument, list every .vmdk file. A name argument can be a part of a file or directory name.

For example:

```
filesys find quantum
/export/192.168.1.110/quantum-4/
/export/192.168.1.110/quantum-4/quantum-4.vmx
/export/192.168.1.110/quantum-4/quantum-4.vmdk
/export/192.168.1.110/quantum-4/quantum-4-flat.vmdk
```

filesys list [<export-path>]

With no command argument, list everything mounted under the Quantum vmPRO /export directory. With an export path, list only what is mounted in that path.

For example:

```
filesys list /export/192.168.201.10
```

group

The **group** commands are:

group status

View the Quantum vmPRO appliance's current group membership.

group create master

Make the appliance the master of a group that other appliances can join.

group join <master>

Add the appliance to the group with master <master>.

group leave

Remove the appliance from its current group. (If the appliance is a master, it can only be removed from the group if the group has no other members.)

group update master <master>

Updates the appliance to its master's new ip address/hostname. Assumes that the master is the same appliance. This command should be run on group members only after net set hostname is run on a master.

help

With a command argument, **help** lists the options for the command:

```
quantum:bsmith> help ssh
Showing commands that start with 'ssh':
   ssh disable
   ssh enable
   ssh status
```

With no arguments, **help** lists a summary of top level commands:

```
The following commands are available:
      autosupport
      cbt
      config
      filesys
      group
      import
```

```
log
nagios
net
ntp
nw
smartmotion
snmp
ssh
system
tsm
vss
```

import

The **import** commands are used during single step recovery from `/import`.

import mkdir <directory-name>

Create a directory under **/import.**

import rmdir <directory-name>

Removes the directory from **/import**.

import edit <cfg-file>

Edit the **cfg** file found in a directory; e.g., **/import/my_directory/vmname.cfg**.

import show errors <directory-name>

List all error (**.err**) files in **/import** and the errors within them.

import list

Show a list of all files/directories inside **/import**.

log

The **log** commands are:

log list

Display a list of all Quantum vmPRO logs.

log search <phrase>

Search all log files for a character string. The string is handled as plain text, using no regular expressions or pattern matching. If the string contains one or more spaces, enclose the string in quotes. Use `Ctrl/C` to exit.

log view <log-file>

Display the contents of a named log. Use the log list command to find log names. Use `Ctrl/C` to exit.

log watch <log-file>

Display the most recent entries (a few lines) of a named log and update the display whenever a new message is added to the log. Use `Ctrl/C` to exit.

nagios

For more information, see Nagios Support on page 159.

nagios disable

Disable Nagios on the appliance.

nagios enable

Enable Nagios on the appliance.

nagios status

Check the status of Nagios.

net

The **net** commands are:

net hosts add <ipaddr> <host-list>

Add one or more hosts.

net hosts del <ipaddr>

Delete a host.

net hosts reset

Deletes all hosts.

net hosts show

Displays a host.

net nslookup <hostname | ipaddr>

Checks for DNS-to-IP or IP-to-DNS mapping. Used for debugging network problems.

net ping <host>

Confirm a connection between Quantum vmPRO and a host.

net reset

Reset network service.

net set hostname <hostname>

Set a hostname or IP address for the Quantum vmPRO appliance.

net show config [all]

Display the current network driver settings for the Quantum vmPRO Ethernet interface.

net show dhcp

Displays DHCP details.

net show hostname

Displays the current hostname used by Quantum vmPRO.

net show routes

Displays all entries in the IP routing table.

net show status

Display network statistics, including live connections.

net tcpdump start [<tcpdump argument> ...]

Begins a **tcpdump** that will write its output to a file similar to "tcpdump.2010-09-20.09-54.log." Only one **tcpdump** can be running at a time.

Any valid arguments for the **tcpdump** command can be used; for example:

```
net tcpdump start -c 100 executes  tcpdump -c 100
```

net tcpdump stop

Stops a running **tcpdump** and prints the file that was being written to.

There is an 8 MB total size limit on the **tcpdump** output files. Older **tcpdump** log files are deleted to make room for new ones as a **tcpdump** is running. If a single **tcpdump** file reaches 8 MB in size, the **tcpdump** will stop automatically.

ntp

Quantum vmPRO can use NTP servers for controlling the internal clock. The **ntp** commands are:

ntp add <server>

Add a time server to the list.

ntp del <server>

Remove a time server from the list.

ntp disable

Stop the use of the NTP service.

ntp enable

Start the NTP service.

ntp reset

Read through the list of time servers and recognize changes.

ntp show

Display the list of time servers.

ntp sync

Synchronize the appliance with the time server

nw

The networker (**nw**) commands are:

nw install

Runs TSM install script provided by pancetera-integ-networker RPM. Customer must install this RPM first.

nw uninstall

Uninstall networker.

nw edit servers file

Edit networker server file.

nw set nsrports <number of ports>

Set number of networker's nsr ports. The port starts from 7937

nw show nsrports

Shows networker's nsr ports setting.

nw enable

Starts networker agent if it is not already running.

nw disable

Stops networker agent if it is running.

nw restart

Restarts networker agent.

nw status

Shows service networker status and `netstat -nlp | grep nsrexecd`.

nw save <save arguments>

Saves files, including directories or entire file systems, to the networker server.

nw mminfo <mminfo arguments>

Reports information about NetWorker media and save sets. The **mminfo** command can produce several different reports depending on the flags specified.

nw recover <recover arguments>

Browses the saved file index and recovers selected files from the networker system.

smartmotion

The **smartmotion** commands are:

smartmotion abort [<policy name>]

Abort a backup.

smartmotion backup [<policy name>]

Start a backup.

smartmotion set [policy <policy name>] [schedule {never | daily <hr>:<mn>}] [email {enabled|disabled}]

Set smartmotion policy parameters.

smartmotion show policy [<policy name>]

Show SmartMotion Policy.

smartmotion status [<policy name>]

Show backup status.

smartmotion sync

Start a backup of the default policy.

snmp

For more information, see SNMP Support on page 158.

snmp disable

Turn off SNMP.

snmp enable

Turn on SNMP.

snmp reset rocommunity

Reset the read-only community string to public.

snmp set rocommunity <community string>

Set the read-only community string to an argument.

snmp status

Show whether SNMP is enabled and print the current read-only community string.

ssh

The **ssh** commands are:

ssh disable

Disables the SSH service. Attempted logins through SSH fail.

ssh enable

Enables the SSH service, allowing SSH logins to the Quantum vmPRO appliance.

ssh status

Displays whether or not SSH is enabled and running, the process ID number, and active SSH sessions.

system

The **system** commands are:

system reboot

Reboot the Quantum vmPRO virtual machine.

system restart services [all]

Restart services.

system status [all]

Show various service statuses.

system show date

Display the current day of the week, month and date, and time, including time zone.

system show license

Shows various information regarding the licenses that you have installed on your appliance. For example:

```
quantum:vmPR5152> system show license

SmartView License information:
   Expires: in 66 days
   Licensed sockets: 20
```

system show uptime

Display the time since the last Quantum vmPRO reboot.

system show version [detail|all]

Display the version numbers of the Quantum components. The all option gives version numbers for all open source packages used by Quantum vmPRO. Updates to the open source packages are included in standard Quantum vmPRO updates.

system shutdown

Shuts down the Quantum vmPRO virtual machine.

system upgrade [local]

system upgrade - checks for Quantum vmPRO updates and then automatically downloads and installs any updates found. No interaction is required. The process uses port 443 and goes to updates.Quantum.com. If you are behind a firewall, you may have to change your port settings as appropriate.

Updates are usually a couple of megabytes in size and use signed, private key/public key encryption to verify and authenticate the update. The command does not update an open GUI. To see any GUI changes that were part of the upgrade, close the browser (or browser tab containing the GUI) and start a new instance of the GUI.

> **local** - allows you to manually perform a system upgrade. The upgrade files must be copied to the upgrade directory, and then you can run the **system upgrade local** command to manually upgrade your vmPRO (see Install Software Updates Offline on page 186).

tsm

The **tsm** commands are:

tsm install

Runs TSM install script provided by Quantum RPM. Customer must install the RPM first.

tsm edit dsmsys

Edit TSM dsm.sys file.

tsm edit dsmopt

Edit TSM dsm.opt file.

tsm dsmc

Run TSM dsmc command.

tsm enable

Enables the installed tsm client service.

tsm disable

Disables the installed tsm client service.

tsm status

View TSM status.

tsm restart

Restarts the installed tsm client service.

vss

The **vss** commands are:

vss query

Get a list of all VMs waiting for VSS backup complete.

vss backup complete [query | all | <vm uuid>] - used to perform log truncation on VMs that have completed a backup

> **query** - check for VMs that are waiting for log truncation, returns a numbered list of VMs, if there are any VMs the user will be prompted to enter a number from the list, runs log truncation for the designated entry
>
> **all** - runs log truncation on all VMs listed
>
> **vm uuid** - runs log truncation on only the VM with the designated uuid

vss backup fail [query | all | <vm uuid>] - similar to vss backup complete, except that the log truncation is not run, VMs are taken out of waiting for log truncation state

> **query** - check for VMs that are waiting for log truncation, returns a numbered list of VMs, if there are any VMs the user will be prompted to enter a number from the list, removes the designated entry for waiting
>
> **all** - removes all VMs from waiting
>
> **vm uuid** - removes only the VM with the designated uuid from waiting

Procedures

This section presents the following vmPRO procedures:

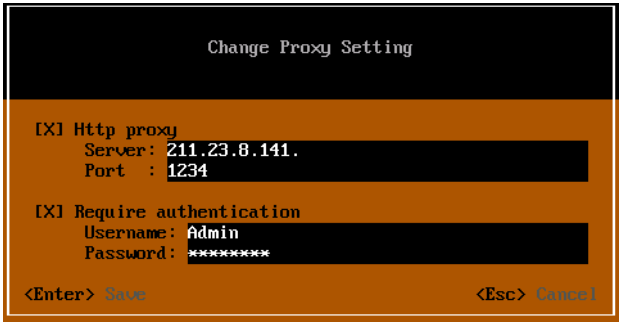
- Proxy Support for Software Updates
- Install Software Updates Offline

Proxy Support for Software Updates

If you need proxy support to access the Internet, you can configure proxy support in your Quantum vmPRO appliance. Currently proxy support can be configured for upgrades only.

1. Log in to access the console **Setup** wizard (see Accessing the Console Setup Wizard on page 26).
2. Select **Proxy Setting**.
3. Enter and save your information (see Figure 161).

Figure 161 Configuring Proxy Settings



Install Software Updates Offline

If your Quantum vmPRO appliance does not have Internet access, you can perform an offline upgrade.

Requirements

- You will need read and write access to **<vmpro-host>\quantum-upgrade** on the appliance. Currently **\quantum-upgrade** is exported with CIFS only.

- You will need to download the appropriate zip file containing the upgrade RPMs.
  - If you have a 2.x appliance, the zip file can be downloaded from:

http://mosaic.quantum.com/downloads/QuantumvmPROUpgrade-2.X.zip

  - If you are upgrading from a 3.0.x appliance, download the two zip files from:

https://mosaic.quantum.com/downloads/QuantumvmPROUpgrade-from30x-1-of-2.zip

https://mosaic.quantum.com/downloads/QuantumvmPROUpgrade-from30x-2-of-2.zip

  - If you are upgrading from a 3.1.x appliance to 3.2, download the following zip file:

https://mosaic.quantum.com/downloads/QuantumvmPROUpgrade.zip

  - The upgrade zip file will contain one or more of these Quantum vmPRO upgrade RPMs: **-unite**, **-base**, and **-tools**. The zip file may also contain third party RPMs.

Procedure for a 2.x or 3.1.x appliance:

1. Extract the RPM files from the zip file and place them in the appliance's **\quantum-upgrade** folder.
2. At the command line, run the following command:

   ```
   system upgrade local
   ```

3. You will be asked for confirmation before the upgrade starts. Once you confirm, simply wait for the upgrade to finish.

Procedure for a 3.0.x appliance

1. Extract the RPM files from the 1-of-2 zip file and place them in the appliance's **\quantum-upgrade** folder.
2. At the command line, run the following command:

   ```
   system upgrade local
   ```

3. You will be asked for confirmation before the upgrade starts. Once you confirm, simply wait for the upgrade to finish.
4. Extract the RPM files from the 2-of-2 zip file and place them in the appliance's **\quantum-upgrade** folder.

5 At the command line, run the following command:

```
system upgrade local
```

6 You will be asked for confirmation before the upgrade starts. Once you confirm, simply wait for the upgrade to finish.

To see any GUI changes that were part of the upgrade, you must start a new instance of the GUI.